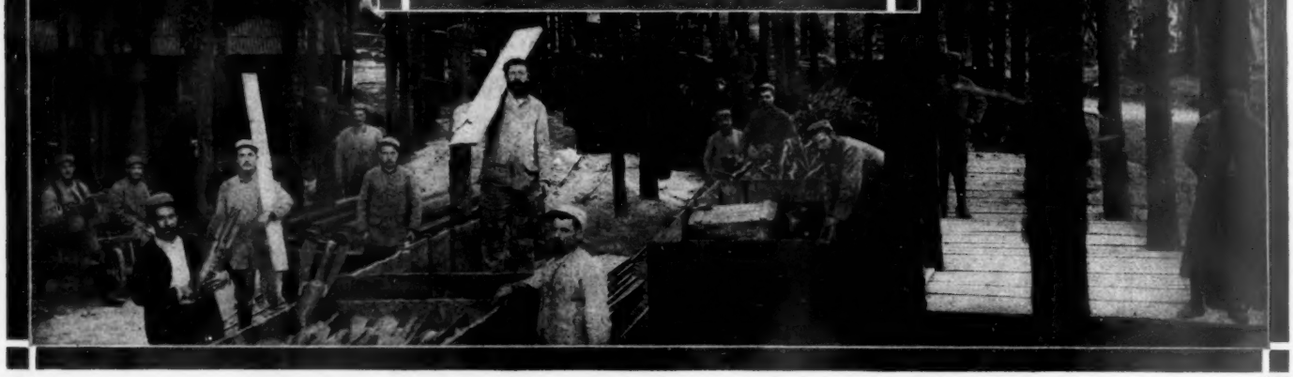
Railway Age

Vol. 64 February 1, 1918 No. 5



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Published every Friday and daily eight times in June by the

Simmons-Boardman Publishing Company, Woolworth Building, New York

EDWARD A. SIMMONS, *Pres.* L. B. SHERMAN, *Vice-Pres.* HENRY LEE, *Vice-Pres & Treas.* M. H. WIUM, *Secretary.*

CHICAGO: Transportation Building. **CLEVELAND:** Citizens Building. **WASHINGTON:** Home Life Building.

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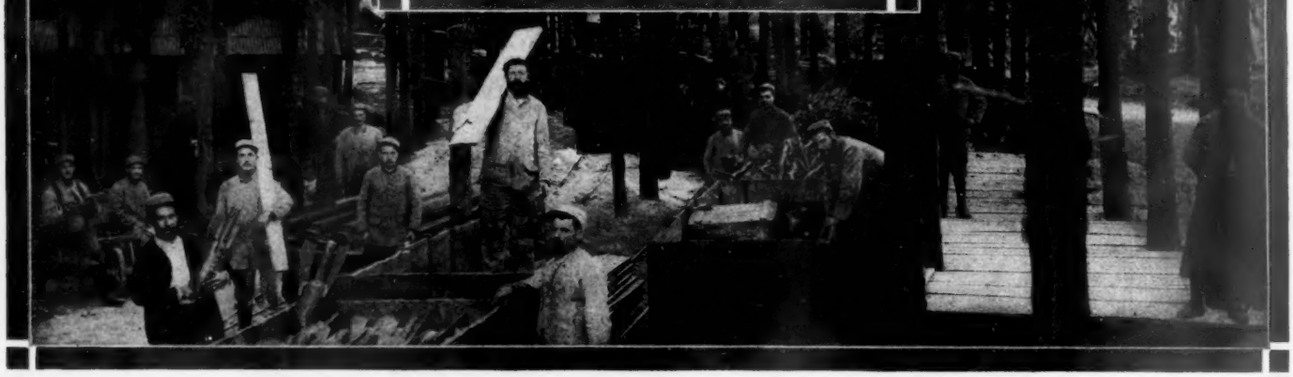

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EDITORIAL

Railway Age

It has been assumed that under the new policy of government control, the director-general of railroads would have the same authority over railway regulation as over railway management. Some are contending, however, that the Interstate Commerce Commission should be allowed to continue to fix railway rates as in the past. This raises the interesting and important question whether any government official or body except the director-general should be allowed to control railway earnings. For the power to regulate rates is the power to control earnings; and the power to control earnings would be, while the government guaranteed the companies' return, the power to create a railway deficit which the government would have to pay from the public treasury. It would seem that the same government official who is charged with responsibility for the financial and operating management of the railroads should also be given authority over the fixing of their rates. An independent official or commission possessing the rate-making authority would be able to embarrass and hamper the director-general in many ways. On the other hand, if the director-general is given power to fix rates it doubtless will be desirable for him to exercise it on the advice of the Interstate Commerce Commission. The commission is the country's most important railway regulating body; and while the director-general should control the general level of rates, the commission's views as to the way in which they should be adjusted in relation to each other should carry very great weight.

Who Shall Fix Railway Rates?

If ever a man on a new job had worse luck than Director-General McAdoo, we have never heard about him. The railroads have now been operated under Mr. McAdoo's direction a little over a month. There is always likely to be at least a temporary decline in morale and efficiency in any business following a change of management. If, therefore, there had been some loss of efficiency immediately after Mr. McAdoo took charge it would not have been surprising. But the director-general has had something worse than some loss of morale to struggle against. Never in the history of this country, we suppose, has there been a January throughout which weather conditions were more unfavorable to satisfactory railroad operation than they were during the month which ended yesterday. Even if there had been merely a normal traffic to handle, the railways would have had difficulty in handling it; and the traffic was abnormal in both size and complexity. Those who during this trying period have visited Mr. McAdoo's office regularly know that he and his assistants have worked as hard as men can work; and they have received as loyal and energetic support as railway officers and employees could give them, in the circumstances; but no loyalty, energy and skill can do more than minimize the effects of a succession of terrible northern blizzards. Mr. McAdoo hasn't had a square deal from the weather man. The weather man also is a government official. We suggest that the best solution of the problem of railroad operation during February might be for President Wilson to direct the weather man to get his orders during that month from the director-general of railroads. The secretary of the treasury was appointed director-general partly to co-ordinate the treasury department and the railroads. The most important need thus far, however, has been more co-ordination between the weather department and the railroads.

One Month of Government Control

If legibly written, a train-order is likely to be correctly read; and mistakes in reading have usually occurred in connection with poor penmanship or faint or dimmed or blurred copies—though how men who are competent to run a train can ever take the risk of accepting anything but the clearest wording must always remain a puzzle. When not legibly written an order brings trouble, if not danger; and those first three words—"if legibly written," constitute an important *if* in the recommendation, printed on another page, for the universal delivery of train orders without requiring the conductor to sign a receipt. The arguments for the use of Form 19 which have been published during the past few years have a convincing sound, yet many roads continue to ignore them; can it be that this extreme cautiousness is due to a feeling that a good many operators ought to be required to reform their chirography before they can safely be trusted to impress an order on a conductor's mind without reading it to him aloud? To throw some light on this subject the *Railway Age* would like to print fac-similes of some well-written train orders, and this is an invitation to any reader to send to the Editor, at New York, any original orders, dated prior to February 1, which would illustrate good and satisfactory practice. Orders copied by a slovenly hand have often been exhibited; it will be encouraging if some of the opposite kind can be shown. Also, let us have some typewritten orders. To what extent are typewriters used at stations for writing train orders?

Train-Order Form 19

The drastic action of the United States fuel administrator in prohibiting the industrial use of coal for five days, except in those industries absolutely essential to the continuance of our national life, has brought home the seriousness of the fuel situation to every citizen. The present situation is a lesson in the need for conservation which should not go unheeded, and any plan which offers the possibility of a material saving in the use of fuel should be given the most thoughtful consideration. In a paper presented by David Moffat Myers before the last annual meeting of the American Society of Mechanical Engineers, an abstract of which will be found on another page of this issue, the amount of fuel wasted in the production of steam which may practicably be prevented by a campaign of education, is estimated to be 1,000,000 car loads a year. The relief that such a reduction in the coal requirements of the country would offer to the railroads in the present congestion and shortage of railroad facilities is clearly indicated by the author in his statement that it is nearly equal to the annual coal carrying capacity of the Pennsylvania Railroad. Of course, such a plan would be of very little value as a means of remedying the acute shortage of fuel existing at the present time. Another winter is coming, however, and there is no reason

Industrial Fuel Conservation

to believe, with many of the activities essential to the conduct of our share of the world war just getting well started, that a reduction of 1,000,000 cars in the coal consumption of the country would leave any of our transportation facilities idle. The number of cars and locomotives which can be added to the resources of the railroads during the coming year will not be sufficient to provide a reserve large enough to insure that under adverse weather conditions, congestion and shortage may not again be encountered.

For the Protection of Bondholders

The report of the Railroad Committee of the Investment Bankers' Association, a part of which is printed elsewhere in this issue, was made before the appointment of Mr. McAdoo as director general of railroads, but it is worthy of study and discussion. The idea on which the report is based is that the association should favor the formation of a bondholders' protective committee at the time that an issue and sale of bonds is made, this committee to employ an expert to continuously keep tab on the management of the railroad selling the bonds. The association referred the report back to the committee for further study. Government control in any case would have made a restudy of these suggestions necessary. It is interesting, however, to note that some of the tendencies of thought in regard to railroad financing which are indicated in this report have been quite clearly expressed in the discussions at Washington which have taken place following the President's proclamation announcing government control. Mr. McAdoo has made it perfectly clear that he recognizes and respects the huge stake which the creditors of the railroads have in their proper management and maintenance. It is hardly conceivable that when the railroads are turned back to their owners (the stockholders), many of the old theories of the rights of the controlling interests among the stockholders to manage and finance the road primarily or solely in their own interests, will have survived. Happily, even before government control the call of patriotism had gone far toward making this type of management unfashionable. It would seem highly probable that in the readjustments which take place after the war, bondholders' (the railroads' creditors') interests will receive very full recognition. The Investment Bankers' Association's committee report, therefore, may very profitably be studied both by railroad men and bankers and the committee should, and presumably will, welcome suggestions, especially from practical railroad men.

Report of the Eight-Hour Commission

After all the commotion caused during most of the year 1916 and the early part of 1917, in the public press, in Congress, and elsewhere, by the demands of the four brotherhoods of railroad train service employees for an eight-hour day and their threats to strike if they didn't get it, it seems rather strange that practically no attention has been paid to the report of the Goethals commission appointed by the President under the Adamson law to observe its operation and effects. The report was submitted to Congress and the President last week but the newspapers carried but a few lines on it and many failed entirely to notice it. Most of those who believed the impassioned statements of brotherhood leaders that they were seeking a reduction in hours rather than higher wages, or of those who believed the statements of the railroads that the eight-hour day in train service would be impracticable and that the Adamson law would merely increase the wages of the highest-paid railroad employees, while decreasing by that much the ability of the roads to pay a more adequate compensation to some of their men who had a much greater need for the increase, probably will never know what the Eight-Hour Commission has found out about those disputed questions after an exhaustive investigation of the subject. But those who will have an opportunity to see the report, an abstract of which is published elsewhere in this issue, will be interested to note that most of the claims made by the railroads during the long controversy have been sustained, while most of those made by the other side have been refuted. The report says that the eight-hour day, as a measure of a day's work *for the purpose of reckoning compensation* for certain classes of railroad employees, has become an established fact, and that while the law has had some effect in reducing the actual hours of work, chiefly in yard service, in road service the reduction in hours has been slight and the principal effect has been to raise wages. The commission also estimates that the increase in expenses caused by the law amounts to over $61,000,000 annually, which is about the same as the estimate made by the railroads in advance. To what extent economies may be introduced to offset this increase in expense, the report says, cannot be stated. While the report is by no means conclusive, and the commission itself states that it was not possible to make authoritative findings as to the ultimate effects of the eight-hour standard work day because conditions during the period of its study were in many respects abnormal, it contains a wealth of valuable information on many disputed questions as to wages and conditions of employment. If it be claimed that the results predicted for the law were not fulfilled only because of the stubbornness of the railroads it may be remarked that the brotherhoods in their latest demands, presented to the railroads and now under consideration by the Railroad Wage Commission, have not asked for a real eight-hour day but a still further increase in wages.

A Great Opportunity for Public Service

THE OFFICERS AND EMPLOYEES of the railways of the United States have at this time the most splendid opportunity to render a great public service that they ever had. Furthermore, the conditions are such that they should be more disposed than they usually would be to work cordially together in rendering it.

There has been in the past much friction between the managements and certain classes of employees. This has been mainly due to controversies over wages and conditions of employment. All wage questions having now been referred to a government commission, the main cause of friction has been removed for the period of the war.

When in the past the operating officers have tried to increase efficiency, many employees have been luke-warm because, whether with good ground or not, they have felt that increased efficiency would mean fewer jobs for employees and more profits for the company. No employee can now have any such reason for refusing to co-operate in all efforts to increase efficiency. No company now can get as many men as it needs. No increase in efficiency will now add to the profits of any company, for under the guarantee plan, no matter what a railway's net earnings are, its owners will get the same amount of money. Every increase in efficiency will benefit the public, and it alone. It will benefit the public by causing more freight and passengers to be hauled for commercial and military purposes. It will also benefit the public either by reducing the deficit or increasing the surplus the government will have after paying the companies the amounts guaranteed them.

There never was in the past—and let us hope there never will be again—a time when the government and the people of the United States needed the very most efficient service which railway officers and employees could render as much

as they do now. This war is an economic as well as a military contest. Perhaps it is even more economic than military. Sad experience has forcibly illustrated lately that the amount of things the industries of America can produce is absolutely dependent on the amount of transportation the railroads can provide. The railroads have not been able to provide all the transportation needed; therefore American industry has been forced largely to shut down. A continuance of conditions which make it necessary drastically to restrict production will surely cause economic, and may cause military disaster.

Nobody can say just how much the efficiency of railway operation can still be increased. But in spite of all that has been done in the past, it must be possible to make substantial further increases. Doubtless some will be secured as a result of plans being worked out under the supervision of the director-general of railroads. But it will take time to perfect and carry out these plans. Meantime, the fate of the railroads, and the fate of the country's commerce and its war preparations, are largely in the hands of railway officers and employees.

Self-interest, self-respect, patriotism, demand that in this crisis every railway officer and employee shall, if possible, do more than ever to increase railway efficiency. The country's economic welfare, its military effectiveness abroad, depend upon them to an extent which hardly could be exaggerated. Let them forget all meaner thoughts, and, to serve their country in this great crisis, strive together as they never did before.

The Australian Transcontinental

THE ARTICLE on the Transcontinental Railway of Australia which will be found on another page of this issue should prove of even greater interest to American railway and supply men than the article on the Baghdad Railway which appeared in last week's issue. It will be read with interest by railwaymen because the conditions met in the railway's construction and the operating problems which will have to be solved are somewhat similar to our own. For railway supply men it will prove of interest because in the railway's construction there were used various kinds of American equipment such as the "notion" in the form of the track-layer spoken of, and because on the cars and locomotives there will be used many American parts and specialties. The time has now come, in fact, when the American railway supply man must look towards Australia with a greater degree of interest than at any time in the past. The Australian railway managements have from time to time bought some supplies from concerns in this country. They have had to buy more since it became impossible to receive deliveries from England, and there is good reason to believe that there will be an increasing business in railway supplies after the war. On the one hand, England will be hard pushed to supply her many other markets the world over, and on the other there is evident in Australia a keen interest in our own M. C. B. standards and a realization of how much Australian operating conditions are like our own.

The Transcontinental Railway is the first to span the Australian continent. It has been built by the Commonwealth itself in contradistinction to Australia's other railways which are separate systems owned and operated by the states. The line has cost $34,000,000, and is intended for high speed commodious service, Australians, like Americans, being inveterate travelers and extremely desirous of comfort and convenience. The line has a tremendous strategic importance from the military point of view, but it also traverses a territory whose commercial possibilities are much greater than has generally been realized. For the line there have been ordered 73 locomotives, 43 passenger cars and not quite 800 freight cars, a considerable quantity of parts and specialties for which have been obtained in the United States.

The project will be regarded with more than ordinary interest, however, because it is built to standard 4-ft. 8½-in. gage. Australia now has no less than three gages and interchange of equipment between the states is impossible. The only state in Australia that has the standard gage throughout at present is New South Wales. South Australia connects with the Transcontinental with lines of standard gage but considerable of the state's mileage is of 3-ft. 6-in. gage. Queensland and Western Australia have 3-ft. 6-in. gage lines, while those of Victoria are 5 ft. 3 in. The question of standardizing the gages is a leading one in the Commonwealth, but agreement as to which gage to adopt has thus far seemed impossible. The adoption of 4-ft. 8½-in. gage for the Transcontinental will be, and has no doubt been meant to be, a strong factor in favor of that measurement as the standard. The effect of the adoption of the world's standard by the commercially and strategically important Transcontinental will be watched with interest by those in America who have worked with and realize the advantage of our nation-wide scheme of freight car interchange as perfected on the basis of our M. C. B. standards.

Store-Door Delivery in New York City

THE DIRECTORS of the Merchants' Association of New York have started a movement to secure the establishment of a general store-door delivery service for less-than-carload freight arriving in Manhattan, and they seem to have a considerable prospect of success. Such an achievement would be a notable event, for the problems to be met are numerous and difficult.

"Store-door delivery" means a good deal more than appears on the surface. In such a congested district as lower Manhattan it means the saving of 24 hours' time on a large proportion of the freight, and if well managed it means a decided economy in the cost of trucking; and much lost motion can be done away with. The difficulties, in ordinary times and under ordinary circumstances, seem insurmountable. Who shall do the business? At what prices? How can the necessary monopoly be maintained? Legislation of a somewhat radical character would be necessary. Claims that rates were too high would probably be brought before the state or federal commissions every day in the year. Even the well-settled legal principle that a railroad may grant a hack-monopoly at a passenger station is challenged in the courts, in one place or another, every few months. Outside rival truckmen would have to be allowed a good deal of freedom. But in the present stress, when every merchant is suffering very costly delays, many objections will disappear; and if it is clearly to the advantage both of the railroads and of the consignees to introduce this economy, the director-general of railroads can be relied upon, no doubt, to approve any plan which promises relief. The relief of the railroads—which would benefit the public as much as it would the roads—is a main object to be sought and an appeal to him is, therefore, in every way legitimate. He can introduce changes which in a less strenuous time would, no doubt, be subject to varied criticism and to interminable delays in the courts.

The report of the Merchants' Association is abstracted on another page. The first question, "Who shall do the trucking?" is answered by a plan to pool existing facilities, which, of course, is the rational course, and one which ought to be most economical. The railroads ought, perhaps, to be required by law to deliver freight to stores, if there were no other remedy for the existing wasteful practices; but if the

present owners of the teams and other facilities can agree to consolidate their energies and their capital, under conservative management, no better thing could be desired. It is understood that a sufficient number of the truckmen of the city are already favoring the plan to assure a successful start. There are more than a hundred of them, not counting the multitude of smaller establishments, and the task of arousing the co-operative spirit is by no means a simple one; but the Merchants' Association and those working with it have done much already. The term "pool" is used only in its theoretical sense; the more exact definition would be, division of traffic. The proposal contemplates zones of railroad stations and zones of stores and factories, each zone to be assigned to a single trucking concern. Actual payments of surplus earnings by one concern to another would not, probably, be necessary; satisfactory benefits should accrue to all interests without carrying the scheme that far.

As to rates to be charged for trucking, there will have to be a comprehensive and stable tariff, of course, and the director-general will have to prescribe it. The state and federal commissions, stopping to listen to a swarm of objectors, would take half a year just to make up their minds —assuming that they felt legally authorized to act—and relief is needed without any unnecessary delay. Moreover, the tariffs, at first, would have to rest on a rather arbitrary basis, for the calculation of the costs of the different kinds of wagon-service might require a good deal of experimental work.

For the protection of the monopoly (as well as for the maintenance of rates) dependence would have to be placed on the iron hand of the director-general. Trucks not subject to rigid discipline would have to be kept out of the freight-station piers. Consignees would have to accept freight sometimes at the cost of a little inconvenience, in order not to clog the delivering machinery. Everybody would have to do his best to promote the scheme for the general good, even if at his own loss.

Now, when we have a transportation dictator, and when everybody is disposed to do his best to hold up the hands of a dictator, would seem to be the right time to try this experiment. The single objective, to save one day's time on thousands of shipments, is alone well worth all the expenditure necessary to effect this reform. Because of the magnitude of the problem and the varied and conflicting interests involved, such a bold venture, in ordinary times, would require not only a genius but a prodigious expenditure of time and labor, and would involve no one knows how much delay; but when people are anxious about their daily bread, and are in danger of freezing, bulls are being taken by the horns every day; and are vanquished. The federal and state authorities (represented by Messrs. Harlan, Whitney and Donges) have already been interested; and Mr. McAdoo knows how to listen to a thing of this kind intelligently. And, finally, the immediate arrangements are in the hands of a veteran railroad officer, J. C. Lincoln, manager of the Merchants' Association's traffic bureau.

New Books

Selected Bibliography on Ports and Harbors. Compiled by W. J. Barney. 144 pages, 6 in. x 9 in. Bound in paper. Published by the American Association of Port Authorities, 110 West Fortieth street, New York City. Price $1.

This book contains a fairly complete list of articles and books, published during the past ten years, concerning ports and harbors; and it deals with prints in the English, French, German, Italian, Spanish and Portuguese languages. The researches of the compiler have covered administration, laws, finance, equipment and engineering.

Letters to the Editor

Green Firemen—One Out of Three

NEW YORK CITY.

TO THE EDITOR:

For many of the positions in the operating department of the railroads of the country it is necessary, under the present stress, to employ a new man every ten weeks, or five times a year; a condition which would be startling if we stopped to realize it in its full meaning. This high percentage of resignations is, no doubt, familiar to readers of the *Railway Age;* it was published in the issue of January 4, page 89. And this dilution of the quality of the personnel is not to be put aside (as a matter that rightfully may be neglected) on the ground that the figures represent only an average; or because the totals include trackmen and freight-house men whose work, for the most part, can be performed with some degree of efficiency even by a green man. The conditions are deplorable in important branches of work directly affecting the prosecution of the war.

On one of the trunk lines, no less than *thirty-two per cent* of the locomotive firemen now in the service went to work, absolutely without experience, within the last four months. Of about fifteen hundred employees in one large locomotive and car repair shop, forty-three per cent have been employed within the last three months.

As has been said in connection with our five-day suspension of business to see if a little coal can be accumulated, the American people can adjust themselves to *anything*. Some local freight agents in and near large cities have learned how to get cars loaded, with a tolerable degree of efficiency, by gangs of men containing many individuals who have had only one day's experience and others whom it is safe to bid good-by, on the certain assumption that at the end of the day they will ask to be paid off. All things are possible.

But the lesson is there, just the same. Mr. Basford and others have told of the virtues of systematic education and the value of a general apprentice system; but here we go on in apparent utter obliviousness to his teaching. The editorial columns of your paper have rung with warnings against the danger of running trains without two first-class men in the cab of the locomotive; yet here we see evidence that hundreds of locomotives have only one man competent to deal with the varied emergencies that are liable at any time to arise in train operation. As I have said, we can adjust ourselves to anything. It is true, without doubt, that our best conductors and enginemen can get a train over the road, when they set themselves resolutely to accomplish the task, with crews whose ignorance is mountainous. All credit to such skilful operating men. Emergencies arise where, but for their ingenuity and fidelity, our transportation machine would break down. Within the last month there have been great numbers of such emergencies. But what I am driving at is that we have no right to tolerate this condition a single day beyond the time necessary to cure it.

To have competent men it is essential not only to pay adequate wages but also to train beginners as long as may be necessary. To have first-class firemen today men had to begin their course of education two years ago. We cannot set the calendar back two years, or even two days; but there remains the duty to begin. War-time pressure does not excuse neglect of this duty. To begin two years behind time is humiliating, but it is the only way out. It is better to begin two years too late than two years and one day too late.

L. D. W.

Senate and House Committee Railroad Hearing

Commissioner Anderson Has Prepared a New Draft of Administration Railroad Control Bill

WASHINGTON, D. C.

THE ADMINISTRATION BILL providing the terms under which the government is to exercise its control of the railroads during the war and providing the basis for agreements with their owners as to the compensation to be guaranteed for their use, is now being considered in executive sessions of the Senate Committee on Interstate Commerce and the House Committee on Interstate and Foreign Commerce. Although it is uncertain when the bill will be reported, Chairman Sims of the House Committee has stated that only a short time will be required. In the Senate Committee it is possible that more time will be required to reach a vote on the amendments to be proposed by Senator Cummins, who feels that the proposed basis of compensation is altogether too liberal and who has not yet been brought around to the idea that the restrictive ideas that he and others have advocated in the past are largely responsible for the emergency with which the government is now trying to deal.

Undoubtedly some time will be required also to consider the amendments proposed to provide that the government control shall terminate after a definite period after the end of the war, but the general prediction is made in Washington that the bill will pass in substantially its present form.

A new draft of the bill prepared by G. W. Anderson of the Interstate Commerce Commission as a result of the points brought out in three weeks' discussion of the bill in the hearings before the two committees was laid before the members last Thursday and after hearing arguments the Senate Committee concluded its hearings on Saturday and the House Committe on Tuesday. Mr. Anderson spent Friday in explaining the provisions of the redrafted bill to the Senate Committee.

The redrafted bill has been introduced in the Senate by Senator Smith as S. 3632 and in the House by Representative Sims as H. R. 8172. The Senate Committee on Tuesday voted 7 to 6 to amend the bill to provide that the government shall relinquish control over the railroads within one year after the end of the war. Those supporting the amendment were Chairman Smith, and Senators Pomerene, Underwood, Watson, Townsend, McLean and Kellogg.

Redraft of the Railroad Control Bill

Sections 1, 2, 3, 4, 9 and 11 of the bill have been entirely rewritten, a new section 13 has been inserted and the former section 13, which has thus far been the principal storm center in the bill, has been changed to section 14. The section now provides that the federal control shall continue during the period of the war and until Congress shall thereafter order otherwise and the following has been added: "But this act is expressly declared to be emergency legislation enacted to meet conditions growing out of war; and nothing herein is to be construed as expressing or prejudicing the future policy of the federal government concerning the ownership, control, or regulation of carriers or the method or basis of the capitalization thereof."

Mr. McAdoo and Commissioner Anderson have insisted that it would be extremely unwise to include in the bill a definite time for the termination of the government control, on the ground that its continuance will be necessary to protect the interests of the security owners as well as those of the government during the period of readjustment, and that to set a time limit for action by Congress would be dangerous.

The new section 1 of the bill is as follows:

That the President, having in time of war taken over the possession, use, control, and operation (called herein federal control) of certain systems of transportation (called herein carriers), is hereby authorized to agree with and to guarantee to any such carrier making returns to the Interstate Commerce Commission that during the period of such federal control it shall receive as just compensation an annual sum (herein called standard return), payable in reasonable installments, for each year and pro rata for any fractional year of such federal control, at a rate equivalent as nearly as may be to its average annual railway operating income (including therein such income of lines acquired by, leased to, or consolidated with such carrier between July 1, 1914, and December 31, 1917), for the three years ended June 30, 1917, and in addition thereto an annual sum payable likewise in reasonable installments reckoned at a rate per centum to be fixed by the President upon the cost of any additions or improvements, less retirements, made during the six months ended December 31, 1917. In the computation of such income, debits and credits arising from the accounts called in the monthly reports to the Interstate Commerce Commission, equipment rents and joint facility rents, shall be included. The standard return and the cost of such additions and improvements are to be ascertained by the commission from the reports, books, and other pertinent data of such carrier and certified by it to the President. Its certificate shall, for the purpose of such agreement, be taken as conclusive of the amount of such average annual railway operating income and of such cost.

Every such agreement shall provide that any federal taxes under the act of October 3, 1917, or acts in addition thereto or in amendment thereof, commonly called war taxes, assessed for the period of federal control beginning January 1, 1918, or any part of such period, shall be paid by the carrier out of its own funds, or shall be charged against or deducted from the standard return; that other taxes assessed under federal or any other governmental authority for the period of federal control or any part thereof, either on the property used under such federal control or on the right to operate as a carrier, or on the revenues or any part thereof derived from operation (not including, however, assessments for public improvements or taxes assessed on property under construction and chargeable under the classification of the Interstate Commerce Commission to investment in road and equipment), shall be paid out of revenues derived from railway operations while under federal control; that all taxes assessed under federal or any other governmental authority for the period prior to January 1, 1918, whenever levied or payable, shall be paid by the carrier out of its own funds or shall be charged against or deducted from the standard return.

The President is further authorized in such agreement to make all reasonable provisions for the maintenance, repair, and renewals of the property, and for the creation of reserve funds therefor, and for the depreciation thereof, to the end that at the termination of such federal control either the property shall be returned to the carrier in substantially as good repair and in substantially as complete equipment as at the beginning of federal control, or that just payment shall be made therefor.

The President is further authorized in such agreement to make all other reasonable provisions, not inconsistent with

the provisions of this act or of the act of August 29, 1916, that he may deem necessary or proper for such federal control or for the determination of the mutual rights and obligations of the parties to the agreement, arising from or out of such federal control.

If the President shall find that the condition of any carrier was during all or a substantial portion of the period of three years ended June 30, 1917, because of non-operation, receivership, or other undeveloped or abnormal conditions, so exceptional as to make the basis of earnings, hereinabove provided for, plainly inequitable as a fair measure of just compensation, then the President may make with the carrier such agreement for such amount as just compensation as under the circumstances of the particular case he shall find just.

The principal change is in the addition of a provision for a return on the capital invested during the last half of 1917, estimated at $240,000,000, and in the definition of the "standard return" to avoid the use of the term "net operating income" which is not well understood because it has not been used in most of the reports of the Interstate Commerce Commission, although it was recently inserted in the monthly report forms. A change was also made in the provision in the second paragraph, for the purpose of clarifying the provision that war taxes shall be paid out of the guarantee and not charged to operating expenses, and in the provision authorizing the President to make agreements in the case of roads in exceptional conditions.

The new sections 2, 3 and 4 are as follows:

Sec. 2. That if no such agreement is made, the President may nevertheless pay to any carrier while under federal control, an annual amount, payable in reasonable installments, not exceeding ninety per centum of the estimated annual amount of just compensation, remitting such carrier to its legal rights for any balance claimed to the remedies provided in section three thereof. Any amount thereafter found due such carrier above the amount paid shall bear interest at the rate of six per centum per annum; and any excess amount paid hereunder shall be recoverable by the United States with interest at the same rate.

Sec. 3. All claims for just compensation not adjusted as provided in section one shall, on the application of the President or of any carrier, be submitted to boards, each consisting of three referees to be appointed by the Interstate Commerce Commission, members of which and the official force thereof being eligible for service on such boards without additional compensation. Such boards of referees are hereby authorized to summon witnesses, require the production of papers, view properties, administer oaths, and may hold hearings in Washington and elsewhere, as their duties and the convenience of the parties may require. Such cases may be heard separately or together or by classes, as the Interstate Commerce Commission or any board of referees to which any such cases shall be referred may determine. Said boards shall give full hearings to such carriers and to the United States; shall consider all the facts and circumstances; and shall report as soon as practicable in each case to the President the just compensation, calculated on an annual basis and otherwise in such form as to be convenient and available for such agreement as is authorized in section one. The President is authorized to enter into an agreement with such carrier for just compensation upon a basis not in excess of that reported by such board, and may include therein provisions similar to those authorized under section one. Failing such agreement, either the United States or such carrier may file a petition in the Court of Claims for the purpose of final ascertainment of the amount of such just compensation, and in the proceedings in said court the report of said referees shall be prima facie evidence of the amount of just compensation and of the facts therein stated.

Sec. 4. The just compensation that may be determined as hereinbefore provided by agreement or that may be adjudicated by the Court of Claims shall be increased by an amount reckoned at a reasonable rate per centum to be fixed by the President upon the cost of any additions and improvements, less retirements, to the property of such carrier made by such carrier with the approval of or by the President while such property is under federal control.

Section 3 provides more specifically for the handling of claims for just compensation which are not adjusted by agreement. No change is made in section 5 and only slight changes in section 6. This now provides that the appropriation of $500,000,000, together with any funds available from any operating income of the carriers, may be used as a revolving fund for the purpose of paying the expenses of the federal control and, so far as necessary, the amount of just compensation, as well as to provide for terminals, improvements, etc., as provided in the original bill. It is also provided that the President may expend such an amount as he may deem necessary or desirable for the purchase, construction or utilization and operation of canals, as well as other water transportation facilities mentioned in the original bill.

In place of section 9, authorizing the President to direct that the federal workmen's compensation act shall be extended to apply to carrier employees, a new section is inserted as follows:

Sec. 9. The President may prescribe a reasonable system and schedule of compensation for the disability or death resulting from an injury occurring, or that may have occurred at any time after the beginning of such federal control, and sustained in the course of his employment by a person employed, either directly by the United States, or indirectly through such carrier, in connection with such federal control and operation; and may likewise prescribe the means and method for the administration of such system and the determination and adjustment of any claim for such compensation and the payment thereof, as well as the expenses of the administration thereof, out of the operating revenues derived from the federal operation of the carrier, or out of any reserve fund or funds created therefrom. The President may, from time to time, revise and modify such system, schedule, means, and method. He may, in his discretion, transfer the administration thereof to the United States Employees Compensation Commission. The rights and remedies so provided shall exclude all other rights and remedies of the person injured, his personal representatives, dependents, or next of kin, either at common law or by statute, whether federal or state, against either the carrier or the United States on account of such injury or on account of the disability or death resulting therefrom.

The President may further prescribe that a reserve fund or funds shall be created, to be charged to operating expenses, for the commuted value of any or all claims for compensation allowed or accrued during such federal control.

To section 10 is added the following: "The provision of this act shall also apply to any carriers to which federal control may be hereafter extended." The new section 11 is as follows:

Sec. 11. That carriers while under federal control shall, in so far as is not inconsistent therewith, or with the provisions of this act, or any other act applicable to such federal control, or with any order of the President, be subject to all laws and liabilities as common carriers, whether arising under statutes or at common law; and suits may be brought by and against such carriers and judgments rendered as now provided by law. But no process, mesne or final, shall be levied against any property under such federal control. The President shall prescribe the means and methods for the payment, out of the operating revenues derived from such federal control, of any judgments and the

enforcement of any decrees or orders that may be rendered against the carrier arising out of any acts or omissions in the course of such federal operation and control.

No change is made in section 12. The new section 13 is as follows:

Sec. 13. All pending cases in the courts of the United States affecting railroads or other transportation systems brought under the act to regulate commerce, approved February 4, 1887, as amended and supplemented, including the commodities clause, so-called, or under the act to protect trade and commerce against unlawful restraints and monopolies, approved July 2, 1890, and amendments thereto, shall proceed to final judgment as soon as may be, as if the United States had not assumed control of transportation systems; but in any such case the court having jurisdiction may upon the application of the United States stay execution of final judgment until the further action of Congress in respect of control of transportation systems by the United States.

Mr. McAdoo's Testimony

William G. McAdoo, Director General of Railroads, testified before the House Committee on January 23, repeating in general the statement he had previously made before the Senate Committee and urging the importance of early action on the bill in order to allow the railroad administration to proceed with its plans and as necessary to the success of the government financing. Some statements he had made before, however, were made clearer or more emphatic in his later testimony and some additional ideas as to his plans were given which made it clear that he does not desire to disorganize the roads. He said he hoped that the proposed appropriation of $500,000,000 would be sufficient to meet the expenditures for the first year for new equipment, locomotives and improvements, and to make advances to roads that needed it and that while he hoped to be able to make the roads earn a surplus he thought it would be unwise to rely too much on that.

Asked about the status of railroad employees and railroad revenues he said that in his opinion the legal status of the employees has not been changed and that while they are in effect government employees they are not technically so. He also thought it would be most unwise to try to handle railroad revenues through the government accounting system. The government has not taken permanent possession of the roads and may never do so; it has taken them for war purposes and the anticipation is that the properties will be restored to their owners. The corporations are acting for the government and he thought it most important that their organizations shall continue unimpaired.

Representative Winslow said a report is abroad that the employees are already assuming that they are government employees and are growing lax in the performance of their duties. "I do not believe there is any laxity," said Mr. McAdoo. "I have had occasion to look into that and my reports don't confirm it. At first there was some feeling of uncertainty but I think that has been overcome. There has been a most gratifying good spirit on the part of both officers and employees and I don't think we need feel any apprehension on that score."

President Must Have Paramount Authority

Mr. McAdoo was emphatic in his contention that the President, as commander-in-chief, must have paramount authority over all phases of the transportation system, including rates, but that the power ought not and will not be exercised except as it may be necessary for the public interest. Some members of the committee were inclined to draw a distinction between the necessity for paramount authority over all matters of operation and the necessity for presidental authority over rates, but Mr. McAdoo said that while the interstate and state commissions should continue to exercise their ordinary functions and act as advisers to him it was necessary that the President should have a veto power over anything that might affect the revenues, which are depended upon to pay the guarantees, and also that he should be able to act quickly in emergencies. He said the President possesses this power by virtue of the act authorizing him to take over the roads and that the Interstate Commerce Commission "has no power to regulate the President."

In using as an illustration his order increasing the demurrage rates, which otherwise would have had to run the gauntlet of 48 states and the Interstate Commerce Commission, Mr. McAdoo showed an appreciation of some of the difficulties resulting from conflicting regulation. He referred to the practice on the part of consignees of using freight cars as warehouses as "one of the greatest abuses in the railroad business" and said he had no doubt that it had reduced the usefulness of freight equipment by 25 per cent. Representative Esch asked if he would use similar summary methods if he wished to increase rates. Mr. McAdoo replied that if there were time to deliberate he would ask the commissions for recommendations. He said he had received many suggestions that passenger fares ought to be increased to discourage travel but, while he did not feel it necessary to consider it for the present, if it became necessary he would not hesitate to act.

In reply to the argument advanced by Clifford Thorne that the President ought not to disturb the power of the Interstate Commerce Commission over rates for commercial traffic Mr. McAdoo said the commission would be kept very busy deciding just such questions but that the power to create a deficiency in the revenues from which the guarantees are to be met would be a very dangerous one to leave unprotected. If it should be considered necessary to advance rates to offset increases in wages he thought the Interstate Commerce Commission ought to hold hearings and make a recommendation to the President.

The Director General was most positive in his contention that no time limit should be prescribed in the bill, saying he thought the fixing of a definite period within which the roads must be restored would be more likely to result in government ownership than if Congress were allowed all the time necessary to work out a plan of readjustment.

C. A. Prouty, Director of the Bureau of Valuation of the Interstate Commerce Commission, testified before both committees that it would take two years more to complete the field work of the valuation and another year to complete the office work. He opposed the idea of allowing the President to have arbitrary authority over rates.

Clifford Thorne, representing the independent oil interests, in his testimony proposed that the railways be guaranteed only the dividends actually paid, in the case of roads that had earned "reasonable" dividends, and that any surplus be divided between the roads and the government. He bitterly opposed the idea of allowing the President to have power to veto a decision of the Interstate Commerce Commission or a state commission, saying that if the question of a rate increase was to be decided in a summary manner by an executive authority the railroads could influence the decision too easily by presenting a case based on a short period of abnormal depression. He said that if the 15 per cent case had been decided in that way the roads would almost certainly have been able to convince Mr. McAdoo on the showing resulting from the February earnings, which "by a strange coincidence" had declined just before the railroad presidents asked for the increase. He said he did not "charge" the railroads with being crooked or of juggling their figures nor a great many other things which a suspicious person would have evolved from the "strange coincidences" which he related, but when Mr. Thom finally asked him what he did intend to charge he said they had packed two months'

increase in wages to the trainmen, which were made effective as of January 1, into the February expenses, "but in a perfectly open and aboveboard way" and that they had not stated to the commission that the February returns were not representative or "indicative of tendencies." He said that if an advance in wages is granted that should not be made an excuse for higher rates but should be paid for by the government as a war expense and while he had no objection to the President's raising rates on war materials, where the government is the shipper, he did object to any advance in commercial rates.

Frank J. Warne, a statistician who has often represented the brotherhoods, testified before the Senate Committee on January 24, giving statistics to show the extent of intercorporate holdings of railway securities. He said that over 30 per cent of the outstanding stock is held by railways for purposes of control while only 16 per cent of the bonds is held by railways. He described the practice of acquiring the stock of subsidiary companies and issuing bonds against the property, saying that the result has been to practically convert stock into bonds and to make fluid capital subject to rigid interest requirements, and that this practice has exposed the railways to financial crises in times of depression and has prejudiced the interests of the employees. "Our railway structure," he said, "rests on a financial structure of sand, a house of cards threatened by the slightest wind." He did not oppose the plan of guarantee proposed, saying that it is better to give the railroads too much than too little and that it would be impossible to measure the value of the service performed by the transportation system, but his apparent purpose was to show the committee that most of the money would go to a comparatively few large holders of securities.

Arguments on the Bill

Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, presented a legal argument before the Senate committee on January 26 on the attitude of the carriers toward the administration bill.

Mr. Thom emphasized the fact that the basis of compensating the railroads proposed in the bill is not intended to fix the compensation directly but outlines a basis for an agreement between each company and the government and he declared that it is in the public interest that there shall be agreements in as many cases as possible.

It is not in the public interest, he declared, for a railroad to accept for its security holders less than an adequate return, for these securities lie at the base of the credit of the financial institutions of this country and constitute the foundation and support of those that have financial strength. It would not be an act of patriotism or in the public interest to agree to a reduction of these values. No mere sacrifice of these holdings which would weaken the financial structure of the country would be in the public interest.

"There should be paid to the owners of these properties what the Constitution requires," Mr. Thom said, "and that is the fair equivalent of the value of the use of that which is taken. You have but one precedent of a similar case to guide you. England is the only great nation that has done what this country has done and in that case the railroads were paid the demonstrated value of their use in the hands of their owners. You have also the recommendation of the President and of the secretary of the treasury to justify that basis."

Senator Cummins asked if he would contend for the basis of the actual earnings if the Interstate Commerce Commission had reduced the rates 15 per cent on December 29.

"Can you justify the crippling of a horse in order to buy him?" asked Mr. Thom. "The value cannot be affected any more by the possibility of the exercise of the legislative power to reduce rates than by the possibility of an increase in rates. There is greater prospect of an increase in rates than of a decrease, but the carriers would not be entitled to the benefit of it. The compensation should be determined on the basis of the value as of the time of the taking and we must look at the conditions and circumstances as they existed at that time."

"If a railroad had been operating at a loss could we take it without paying anything?" asked Senator Cummins.

Mr. Thom replied that the fairly demonstrated earning power was the minimum which could not be reduced without confiscation and that where there was no fairly demonstrated earning capacity some other principle must be taken as a basis. He cited the case of two warehouses, one which had earned a profit and the other one similar but new and without demonstrated earning capacity, saying that the new warehouse could not be taken without compensation.

He also pointed out that the earning capacity of the roads at the time they were taken was based on rates which had long been subject to regulation and which during the past 10 years had been practically fixed by the Interstate Commerce Commission and, therefore, must be presumed to be reasonable. "If one railroad earned more than another from reasonable rates," he said, "it was because it performed a larger measure of public service. Congress, through its deputy, the Interstate Commerce Commission, cannot fix rates as reasonable and then reduce them on the ground that the earnings are too high."

Mr. Thom also urged that provision be made in the bill for returning the roads to their owners within a year after the expiration of the war or at the discretion of the President. He repeated his argument before the House committee on Monday.

Brief arguments were also made before the Senate committee by S. H. Cowan, representing Texas shippers; Glenn E. Plumb, representing the brotherhoods; Clifford Thorne and Commissioner Anderson.

Mr. Cowan argued that the roads were not entitled to be guaranteed any surplus and suggested that the advantages of competition be retained by allowing the roads part of the surplus if they could earn it, the rest to go to the government. "You ought to give the roads all they are entitled to and a little bit more," he said. "Whether they have bought the property, whether it was given to them, or whether they stole it, they are entitled to a reasonable return on it if their consciences will let them take it, but after you have guaranteed interest and dividends, that is all that is required. Let the government use part of the surplus to help the weaker roads and furnish a stimulus to the managers by giving them a chance to earn a little more than the guarantee. Mr. Thom talks about crippling a horse in order to buy him, but the plan proposed here is to take a crippled horse and doctor him up and then pay as much for him as for a good horse."

Mr. Plumb argued that railroad property is irrevocably devoted to public use and under the charter limitations is not private property. He said that if the carriers insist on their right to the "pound of flesh," an examination of the "bond" will show that they are not entitled to a drop of blood and they can be prevented from taking it because under their state charters they have no right to do a dollar's worth of interstate business.

Mr. Thorne argued particularly against letting the President, or Mr. McAdoo for him, fix rates. He said the railroads want the rates placed as high as possible, both for the effect on the value they may claim if the government buys the roads, and also so that they will be on a high basis if the roads are restored to their owners, and that the government will have a temptation "to milk the shippers of the country for money to carry on the war by an indirect tax in place of a bond issue."

Senator Cummins asked if the men surrounding Mr.

McAdoo are not those who in the past have consistently advocated higher rates. Mr. Thorne replied that they were and that whereas formerly the Interstate Commerce Commission building was all cluttered up with railroad men who crowded the elevators and halls and offices "swamping the commission" with their efforts to put forth their views as to higher rates, "now they are permanently lodged there by the government" and frequently a shipper cannot get to Mr. McAdoo except through a railroad man.

This aroused the indignation of Commissioner Anderson who asked if it was not just as much the duty of a Commissioner to hear a railroad man as to hear Thorne or other representatives of the shippers.

Mr. Thorne replied that that was, of course, the case, but that the shipper is entitled to a hearing and that the National Industrial Traffic League had been denied a hearing in the demurrage rates, while the "other fellows could discuss the matter in an ex parte way in Mr. McAdoo's private office." "If you turn this power over to a one-man tribunal," he said, "it will work disaster to many industries."

"If Congress wants to avoid litigation," he said, "it will have to accept the proposition made by the carriers," meaning presumably the proposition made by the President. He urged, however, that the guarantee be confined to fixed charges, reasonable dividends and a share of the surplus. He read resolutions adopted at a convention of the Iowa Grain Dealers' Association on January 24, advocating that the Interstate Commerce Commission should retain its present authority over rates and saying that "to substitute the snap judgment of one man would be a calamity to American industry."

Commissioner Anderson said that he had been working night and day on the bill and on methods for dealing with the situation since November 18. This is about the time the Railroads' War Board sent for the vice-presidents of the eastern roads to take what were considered at that time drastic measures for the relief of the congestion. The President's proclamation, which was given out on December 26, he said was completed on December 24. The essence of the plan he originally worked out has stood the fire of criticism better than he had hoped it would and while he had no idea that the bill is perfect, he said that practically no proposition has been presented that is not now represented in the redraft of the bill which has not been excluded "as an impossible proposition."

The plans proposed by Messrs. Cowan and Thorne for guaranteeing interest, dividends, and part of the surplus, he said, "would be destructive of the very purpose of federal control, which is to co-ordinate the railroads into one system and to make railroad men feel that they are working for the nation instead of for individual companies." "If you reject that," he added, "there is practically nothing before you attacking the proposed basis as the foundation for an agreement. These plans all have the same inherent vice—they won't work."

To show the views as to the right of a carrier to earn a return on invested surplus, which he holds "when not dealing with war emergency conditions," Mr. Anderson read from an article he had written, advocating that the return to be allowed should be based on the "amount of cash capital actually invested honestly and with prudence," but, he said, "we are now dealing with a war emergency and a condition, not a theory, confronts us. This is no time for Senator Cummins, with whom I thoroughly agree, and myself, or Mr. Plumb or Mr. Thorne, to indulge our pet theories, although we are right. Mr. Thorne is somewhat radical and Mr. Thom is all wrong."

Mr. Anderson said he had very reluctantly come to the view that it was necessary to leave the absolute power of rate-making in the hands of the President, although he ought not to use it except in emergencies but ought to employ the machinery of the commissions. He had suggested that a statute be drafted which would retain in the Interstate Commerce Commission all of its power not inconsistent with the necessary war power of the President but had found no one who can draw a statute that will work, although he thought that the President had made it clear in his proclamation that he would not interfere except in special cases. He said that if Mr. Plumb had had to draft a bill that would meet all his criticisms, instead of merely presenting an oration about them, he would not have had time to read "The Merchant of Venice" recently.

As to the rate question he said: "If the railroads are not self-supporting it will be the duty of the President to raise the rates."

To meet an objection that under the wording of the revised bill a railroad once taken over by the government would have to remain under government control until Congress orders otherwise, Mr. Anderson suggested an amendment to Section 14 providing that the President may at any time relinquish control of all or any part of any system of transportation which it was not needful or desirable to retain.

As to the proposal to set a time limit Mr. Anderson said that most thinking people who have studied the question are coming to the conclusion that there should be no time limit. Mr. Thom had referred to the possibility of a political campaign on the question of government ownership. This would be even more dangerous, Mr. Anderson said, if Congress were required to decide the question by a certain date. "That is a question you have got to face," he said. "We can't do anything now that will head it off."

New Form of Application for Priority Certificates

THE PRIORITIES DIVISION of the War Industries Board has issued a new form of application for priority certificate, which will be put in effect immediately for all future applications for priority in war orders. Since September 21 the division has been issuing two kinds of certificates—principal and subsidiary priority certificates. From now on, only one kind of certificate will be issued, to be known as a "priority certificate." There will be no change whatever in the status of the principal and subsidiary certificates now outstanding, but the new form will be used alike in the future for all who have been accustomed in the past to apply for principal certificates as well as those who have been applying for subsidiary certificates.

The new form of application differs from the previous forms chiefly in that it is much more complete and calls for all of the facts which the division must have in order to consider the request intelligently; and, in the second place, each application must be verified by an affidavit of the applicant, except the applications which are made by representatives of the American or allied governments.

The division will continue in the future, as in the past, to issue certificates only on specified orders for materials, commodities, or work. No industrial plant, material, or commodity will be given blanket certificates. A new priority circular, to be known as Priority Circular No. 3, with additional general information about the priority system will be issued within a few days.

The new priority certificate application contains 10 questions which must be filled out in detail by the applicant.

The questions are as follows:

1. Insert here name and address of person who is to supply the material, etc., or perform the work described in paragraph 5, below. This is the person on whom certificate is desired.

2. Insert here name and address of applicant.

3. State here number and date of order placed with person named in paragraph 1, above, for which priority is desired and date delivery is promised and desired, respectively.

4. If order was placed by other than the applicant named in paragraph 2, above, insert here name and address of person who did place the order.

5. Insert here particulars of order on which priority is desired, viz.: Quantity and description of material; or amount and description of work.

6. List here the numbers, ratings, and subject matters of priority certificates, if any, under which the applicant is working, and for which the material, etc., described in paragraph 5, is needed.

7. If material or work described in paragraph 5 is ultimately destined to fill one or more government or original orders, insert name of government department or of original contractor and number and date of orders.

8. State fully why priority is desired and what effort, if any, has been made to secure delivery without priority assistance. The above must include a statement that no part of the material, etc., for which priority is asked, has been shipped.

9. (*a*) Has applicant the plant and equipment necessary and now available to execute all orders upon which he is now engaged? (*b*) What per cent of applicant's plant output is now devoted to government orders?

10. If applicant has not the plant and equipment adequate to execute all orders upon which he is now engaged, what plant extensions or additional equipment are necessary?

Train Despatching*

THE PROMPT MOVEMENT of trains affects the earnings of the road quite as much as the successful operation of any other department. The train despatcher's office is the clearing house; all departments come in contact with, and do business through, this office. The despatcher's work depends more upon the co-operation of all than that of any other employee, and a great measure of his success is due to help accorded him by train and engine men, yardmasters, and operators. Despatchers should be given the opportunity to go out over the road at frequent intervals, without loss of sleep or pay. This is profitable to the company, for there is no question but many an unwise move is made on the despatcher's checker board, which would not be made were he thoroughly familiar with the situation. Tell the despatcher as far ahead as possible when a train expects to move, where to, and nature of work. Tell him of any expected delay. If you are on a special train and you are authorized to run at a certain speed, whether fast or slow, tell the despatcher, so he may plan accordingly. How much ahead would you be if you ran 45 miles an hour when he was figuring on 30 or 35, and he stuck you 15 or 20 minutes?

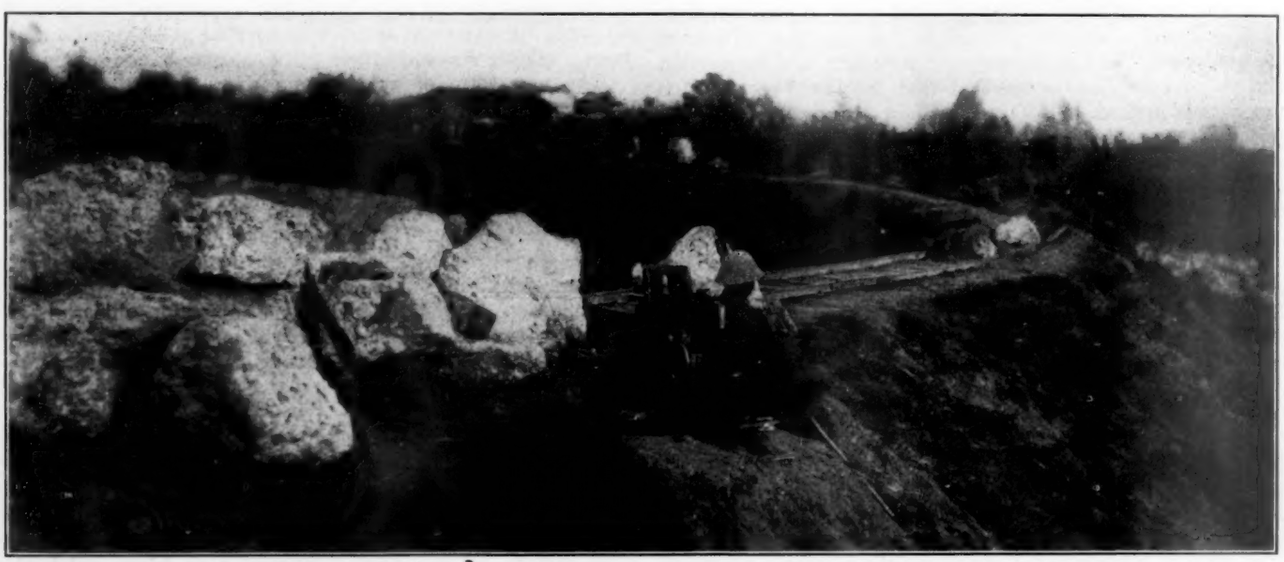
It is a mistaken idea that because a despatcher is not sending orders continually, he is not working. Let no one attempt to estimate the amount of his work by the number of orders. Unlike other officers, who do the thinking and tell some one else to do the work, he does both. Care should be taken that the trick despatcher shall not be burdened with detail work and that his office be kept private. To make the despatcher responsible for all transportation matters in addition to the handling of trains has proved that a man cannot do a half dozen things at one time; something must be slighted; and this is false economy.

The operator is the eyes and ears of the despatcher. Good, prompt, efficient operators are worth their weight in gold to the despatcher, while the slack, inattentive ones are not worth their salt. I sometimes imagine that this department does not receive equal attention with others, considering its importance.

In your daily work and complaints, "have a heart." We are all striving toward the same end, to move the company's business. It has been said that the life of a train despatcher's nervous system is about 15 years, under present conditions; and I sincerely believe that the time is not far off when the despatcher is going to be allowed his one day off a week, the same as other workers.

We are gradually, year by year, striving more, co-operating more, and more intelligently realizing the importance of each other's work. This is the day of trained experts. Put the best you have into your job, and your future is assured.

*From a paper by S. F. Spurbeck, despatcher, Duluth, Missabe & Northern, Proctor, Minn.; read before the Missabe Railway Club of Proctor.



Photograph from Underwood & Underwood, N. Y.

A Machine Gunner and Big Boulders Will Help Block the Progress of the Austrians Along This Italian Railway Line

Hopper Bottom Gondola Cars for C. M. & St. P.

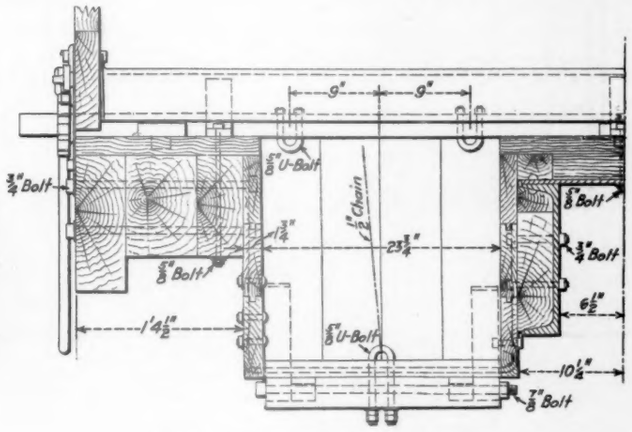
Composite Construction With Heavy Steel Center Sill for Equipment Built in Company's Shops

THE Chicago, Milwaukee & St. Paul is now building at its shops at Milwaukee and Tacoma 1,500 50-ton gondola cars. A composite design has been adopted for this equipment, principally on account of the difficulty of securing prompt deliveries of steel at this time. Although heavy

Hopper Car for the C. M. & St. P.

sills are used, the ratio of light weight to capacity has been kept reasonably low, the average light weight being 42,100 lb. The ratio of the revenue load to the maximum total weight is therefore 72.3 per cent.

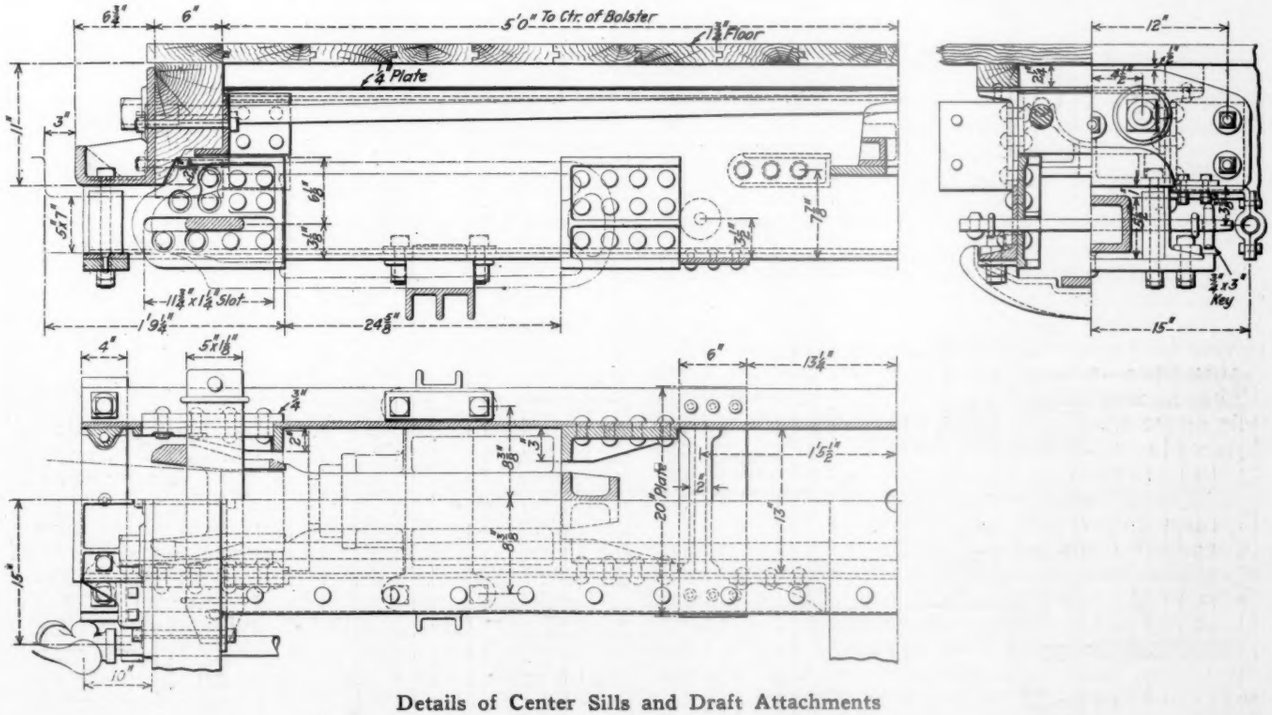
In the design of the car the principal aim was to use wood as extensively as possible and yet provide a car that would give good service and insure economy from the standpoint of maintenance. With this thought in view, a heavy steel center sill has been provided to take care of the buffing and pulling stresses, while the weight of the body and lading is carried on wooden sills and truss rods. The length of the car over the end sills is 42 ft., the maximum width, 10 ft. 1½ in., and the maximum height from the top of the rail, 8 ft. 6¼ in. The body of the car is 39 ft. 11½ in. long, 8 ft. 7 in. wide,



Cross Section of Car at Hopper

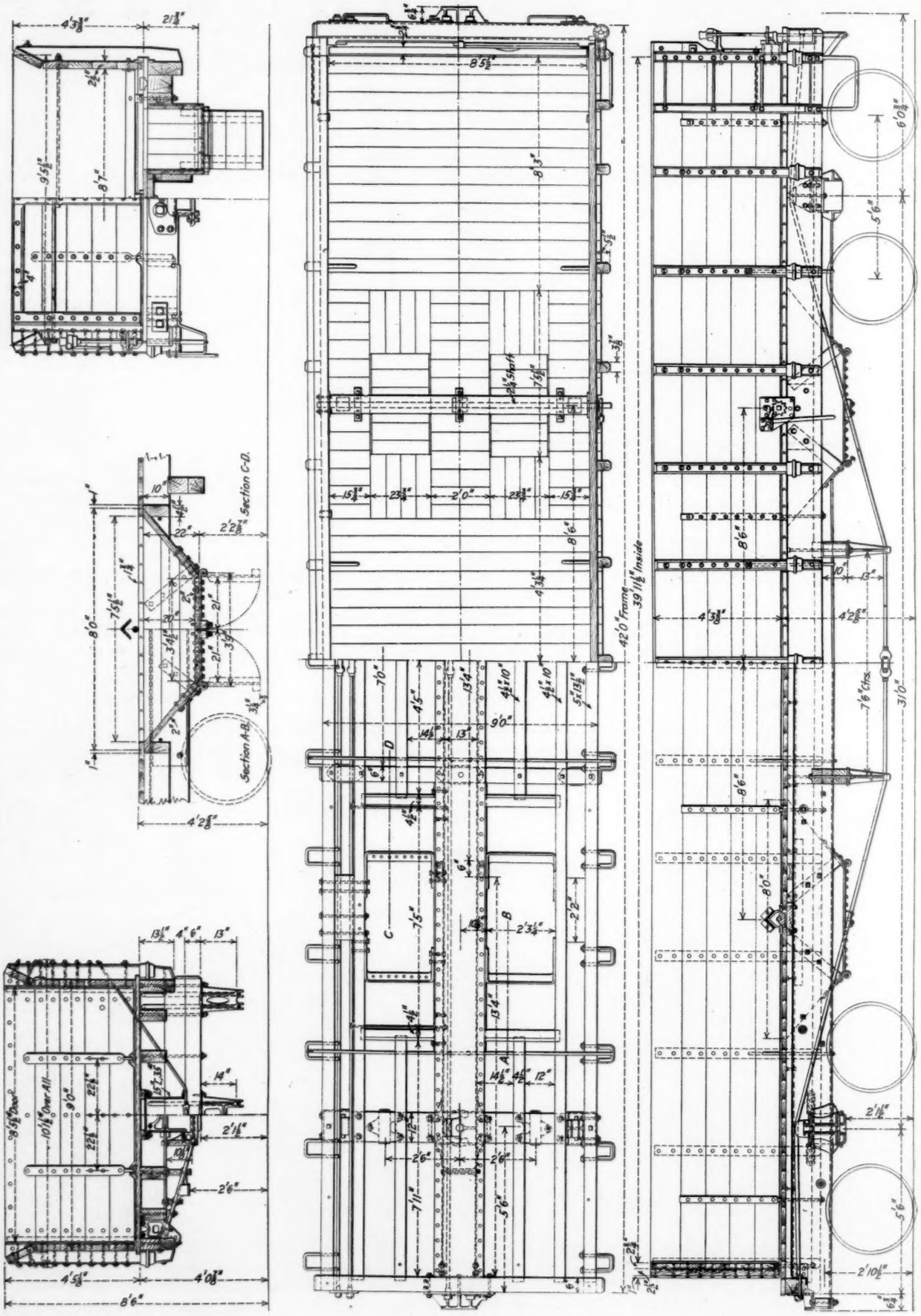
and 4 ft. 3⅜ in. deep. The cubical capacity, with the load heaped 2 ft. above the sides, is 2,000 cu. ft.

In the construction of the car body the metal parts have been confined almost wholly to the center sill members. Two channels, of 15-in., 37-lb. section, extend from end to end



Details of Center Sills and Draft Attachments

of the car and are reinforced for the entire length by 1¼-in. by 20-in. cover plate. Under the center sills two truss rods, 1½ in. in diameter with 1¾ in. upset ends are provided to carry the weight of the lading. The body bolsters are built



General Arrangement of the C. M. & St. P. 42-Ft., 100,000-Lb. Capacity Gondola Car

up of rolled sections and filler castings. The tension member, which passes through the neutral axis of the center sills, is ¾ in. by 12 in., while the compression member is 1⅛ in. by 12 in. The sides of the car body are supported by two wooden sills the outer 5 in. by 13½ in.; the inner 4½ in. by 10 in. These sills are also reinforced with two 1½-in. truss rods.

The four hoppers, 23¾ in. wide and 8 ft. long are placed between the center sills and side sills, the centers being 12 ft. 3 in. from the ends of the car. Short intermediate sills extend from the ends of the car to the hoppers and between the hoppers, being supported by the end sills, body bolsters and needle beams. The side stakes are 3⅞ in. by 5½ in. Every third pair of stakes is tied together with a ¾ in. rod extending under the center sill. The sides of the car body are 2½ in. thick and the floor is 1½ in. thick.

The hoppers are reinforced on the sides and the ends by metal strips bolted on the inner side to the center sill channel and on the outer side to the two side sills. The dumping mechanism consists of 2¼-in. shafts extending across the car above the deck, with chains to raise the hopper doors. A 5-in. by 5-in. angle iron is placed over each shaft to protect it from the lading. The details of construction of the hoppers are shown in one of the illustrations.

On account of the difficulty of securing clearance between the brake wheel and the end of the car, special types of ratchet brakes have been applied. Among the other specialties used on these cars are Bettendorf truck side frames, Bettendorf and Buckeye cast steel truck bolsters, Barber lateral rollers, Ajax brake beams, Major couplers with Buckeye cast steel yokes and Miner friction draft gear.

The Zone System for the Distribution of Coal

The Committee Appointed Jointly by Mr. McAdoo and the Fuel Administration Begins Work

As briefly noted in last week's issue, Director General of Railroads McAdoo and the Fuel Administrator have appointed a joint committee to work out a plan for eliminating the cross-hauling of coal by dividing the country into districts or zones of production and distribution to the end that coal produced in each district will be consumed in that district or in defined districts of destination. The plan is to limit the shipment of coal to certain restricted consuming districts, which will prevent long and circuitous hauls, cross-routings and congestion.

The committee consists of Howard Elliott, of the New York, New Haven & Hartford, and A. G. Gutheim, of the Bureau of Car Service of the Interstate Commerce Commission, appointed by Mr. McAdoo; G. N. Snider, traffic manager of the Fuel Administration and formerly coal traffic manager of the New York Central, and S. A. Taylor, a Pittsburgh mining engineer, named by Dr. Garfield, and C. E. Lesher, chief statistician of the Bureau of Mines. Some preliminary details of the zone plan were announced by the Fuel Administration on January 25.

The adoption of such a plan was repeatedly urged upon the Fuel Administration by the Railroads' War Board last fall but the railroads had no power to put it into effect. The Fuel Administration did not display marked enthusiasm toward it when its adoption might have made unnecessary the expedient of declaring an embargo on manufacturing and a series of Monday holidays. The War Board, however, continued to recommend the zone system and on December 19 submitted to the Fuel Administration a completely worked out plan in which the producing and consuming districts for the entire United States were defined in detail. This plan was later described in testimony before the Senate committee conducting an investigation into the causes of the shortage of coal, by F. S. Peabody, a practical coal man, who worked out the details with the railroad committee. Dr. Garfield also outlined a plan before the Senate committee on December 26. Mr. Peabody, who was chairman of the Committee on Coal Production of the Council of National Defense before the policy of coal production was supplanted by the policy of coal conservation, testified that the plan would result in a saving of 20 per cent in the use of coal cars and a corresponding reduction in the cost of coal at destination.

In a letter of December 19, submitting the plan to the Fuel Administration, Fairfax Harrison, chairman of the Railroads' War Board, said: "We again urge upon you the paramount necessity of adopting the principle of limitation of cross-hauling of coal upon which this plan is based. The power to do this comprehensively lies with the Fuel Administration and, as we understand it, with no one else."

The Railroads' War Board's plan has been printed in pamphlet form, with a series of maps showing the various producing districts in red and the consuming territory to be served from each in yellow. The producing districts are all carefully defined and a destination index shows the producing districts from which each territory is to be served. It is understood that it was used to a considerable extent as the basis of the new plan.

The Fuel Administration's statement outlining the new plan is as follows:

"The plan contemplates a system of coal distribution that will insure the speediest possible movement of coal from the mine to the consumer, and the immediate return from consuming centers to the mines of empty coal cars. It will eliminate so far as possible cross-hauling of coal by providing for the movement of coal from the mine to the consumer along the shortest possible transportation lines.

"Under the plan each state will be allotted its quota of the estimated output of bituminous coal. This allotment will be supplied from the output of certain definite producing districts. Coal for each state must move from the producing districts in which the state's allotment is located and from no others.

"The producing fields of the country have been divided into some 20 districts and a district representative will be named in each of these. Each district representative will equitably allot all orders and requests for fuel from the Fuel Administration among the various shippers and mines within his district. They will be responsible for the prompt filling of coal orders and the prompt movement of coal out of the producing fields. They will see to it that each state receives only its authorized quota from the producing districts. All requests and orders for emergency coal, either by the federal fuel administration or by state fuel administrators, will go through these district representatives.

"The whole system of coal distribution and apportionment will be under the general direction of J. D. A. Morrow, manager of apportionment and distribution, working directly under U. S. Fuel Administrator Harry A. Garfield.

"The new distribution plan, which was conceived by the

Fuel Administration soon after its organization, called for an enormous amount of detail work in the establishment of temporary quotas in the coal budget for each state. This work has been progressing for two months under tremendous pressure. Hundreds of statistical experts, under the direction of experienced coal men and transportation executives, have been at work on this problem, in co-operation with the Geological Survey. It is expected that within a short time a definite announcement of the temporary quotas of the consuming states and of the producing sources from which each shall secure its supply may be made.

"Representatives of the Fuel Administration and representatives of the railroads named by Director General McAdoo are now at work developing the phases of the plan which concern transportation, in order that the best results, both for the movement of coal and for transportation generally, may be secured."

The operation of the plan, so far as it has now been inaugurated, was explained to federal fuel administrators in the various states in a letter from Dr. Garfield. The letter said in part:

"As soon as district representatives are appointed, all state administrators who may call upon them will be notified. Individual shippers and mines within those districts for which district representatives have been appointed will be notified to refer any orders or requests for shipment of coal made upon them by any member of the U. S. Fuel Administration to the proper district representative. No emergency requests should be made directly to Washington by state administrators unless the proper district representative has been unable to supply the necessary coal.

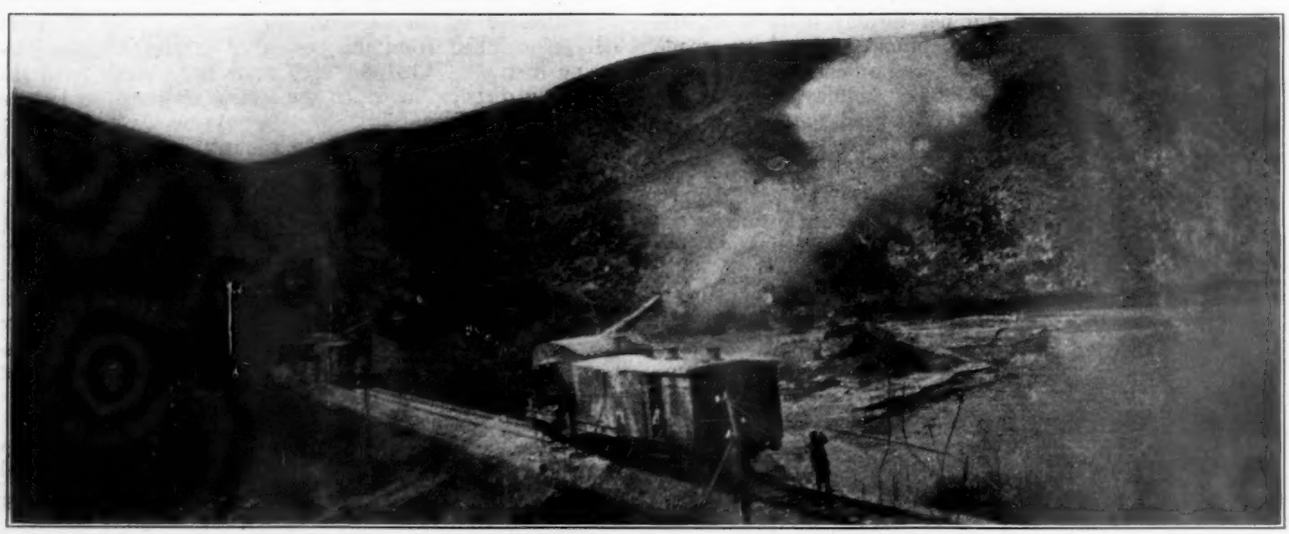
"In order that the bituminous coal supply of the country may be apportioned equitably among the different states, and among the various consumers in each state according to the relative importance of their needs, it is necessary that the work of the Fuel Administration in regard to the apportionment and distribution of bituminous coal be not limited to the relieving of emergency shortages. Accordingly, the available coal production of the country is to be apportioned among the various states, based upon previous consumption and the changes resulting from the entrance of the United States into the war. In order that cross hauling may be reduced to a minimum and that each state may receive coals adapted to its needs, the particular fields from which each state shall draw its supply will be designated, (by-product and gas coal excepted). When this budget is complete, the consumers of each state will be notified through the press that their coal must be obtained from certain specified fields. Producers will then be allowed to ship only to consumers in the states designated, and jobbers will be required to observe the same rules. In other respects the normal distribution of coal will go on without interference.

"State administrators, as soon as the tentative apportionment is complete, will be informed as to the particular fields upon which they may call for coal, and the quantities they may secure from each. When a state is currently receiving its full allotment of coal, all further needs must be met by reducing the quantity supplied to other consumers in that state. District representatives will be instructed to comply with any requests for coal made by designated state administrators up to the amount allotted to their respective states. Should any state have a demand for coal in excess of its allotment, this excess will have to be taken care of by a curtailment of consumption, or a temporary or permanent readjustment of the allotment be made by Washington.

"The foregoing is a part of the new plan, details of which are being worked out as rapidly as possible and will be announced as soon as they can be perfected."

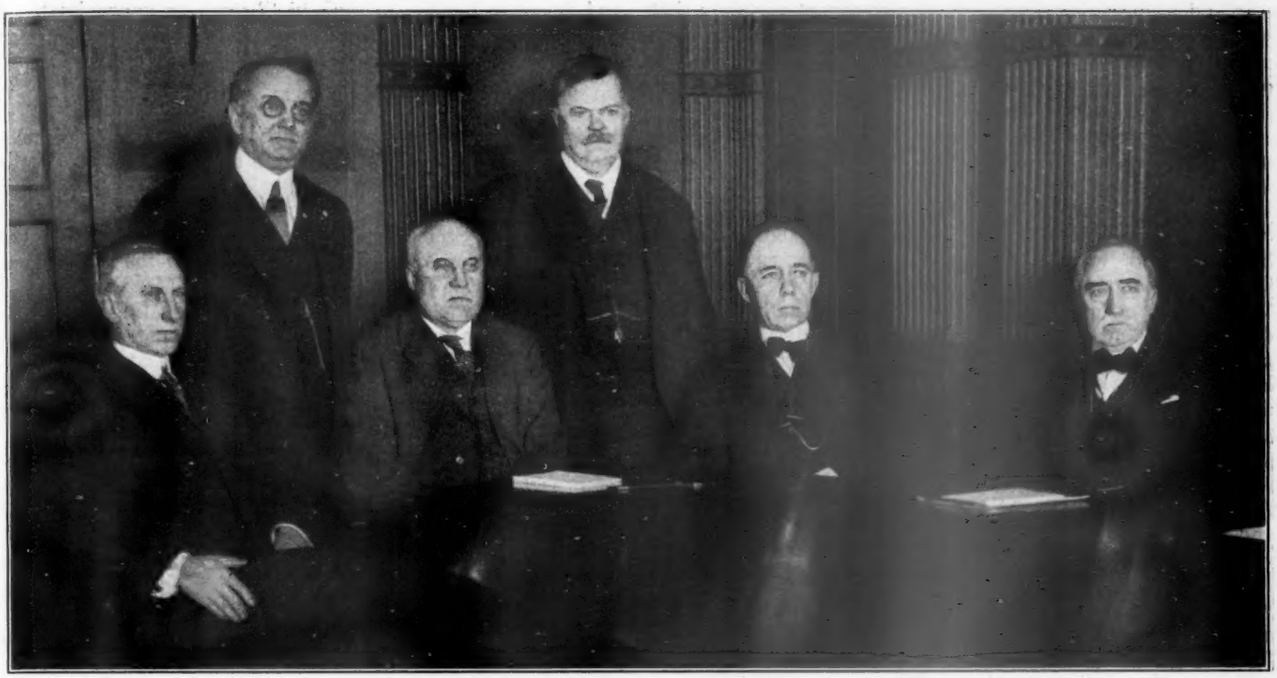
Under the regulations of the United States Fuel Administrator Garfield of January 17, fuel will still be shipped to the list of preferred consumers contained in the order before industry generally receives its supply. After this preferred list has been cared for, the Fuel Administration in each locality throughout the country will endeavor to supply those concerns whose operations have been listed by the departments of the government as most necessary to the conduct of the war. Section 1 of the order of January 17 provided:

"Until further order of the United States Fuel Administrator, all persons selling fuel in whatever capacity shall, in filling their contracts or orders now on hand, give preference to necessary current requirements of: railroads, domestic consumers, hospitals, charitable institutions; Army and Navy cantonments, public utilities, by-product coke plants supplying gas for household use, telephone and telegraph plants, shipping for bunker purposes, the United States for strictly governmental purposes (not including factories or plants working on contracts for the United States), manufacturers of perishable food or of food for necessary immediate consumption, and municipal, county, or state governments for necessary public uses. Any tonnage remaining after the foregoing preferred shipments have been made may be applied in filling any other contracts or orders."



Central News Photo Service.

Armored French Train in Action in the Vosges Mountains



Left to right, seated—J. Harry Covington, chief justice of the District of Columbia Supreme Court; Franklin K. Lane, secretary of the interior; C. C. McChord, of the Interstate Commerce Commission, and William R. Wilcox, former chairman of the Republican National Committee. Standing—W. A. Ryan, secretary of the board, and F. W. Lehmann, general counsel. Photo copyright by Harris & Ewing, Washington, from Paul Thompson, N. Y.

Railroad Wage Commission Begins Hearings

Makes Statement as to Its Duty and Hears the President of the Railroad Telegraphers

THE RAILROAD WAGE COMMISSION, appointed by Director General of Railroads McAdoo to make a general investigation of railroad wages as the basis for a recommendation to him, began a series of public hearings at Washington on Monday, January 29, and was confronted at the outset by a request from H. B. Perham, president of the Order of Railroad Telegraphers, for a 40 per cent increase in wages for the members of the organization and others of the same class of employees. This request, he said, had not been made to the railroads, although requests for a revision of schedules had been presented on 24 railroads before the government took them over, but his members had "become excited" when they heard that the government was going to raise wages and he had received thousands of letters urging him to present the request.

The wage commission has established itself in offices in the Department of the Interior building. F. W. Lehmann has been appointed general counsel and a board of statisticians has been appointed consisting of Charles P. Neill, manager of the Bureau of Information of the Southeastern Railroads and formerly United States Commissioner of Labor; F. A. Burgess, assistant grand chief of the Brotherhood of Locomotive Engineers; and A. O. Wharton, president of the Railroad Department of the American Federation of Labor.

A tentative program of hearings has been outlined, at which the following labor leaders will be heard: T. H. Garvey, representing maintenance of way employees; E. H. Norton, representing the Order of Railway Station Agents; W. G. Lee, president of the Brotherhood of Railroad Trainmen; A. B. Garretson, president of the Order of Railway Conductors; S. E. Heberling, president of the Switchmen's Union; W. S. Carter, representing the Brotherhood of Locomotive Firemen and Enginemen; and A. O. Wharton, representing the mechanical employees, helpers and apprentices and railway clerks. It is understood that railroad officers will also be heard.

Statement of Commission

Franklin K. Lane, Secretary of the Interior and chairman of the commission, read an opening statement regarding the scope of the investigation. The commission is acting under the authority of General Order No. 5, issued by the Director General, which provides that:

"The commission shall make a general investigation of the compensation of persons in the railroad service, the relation of railroad wages to wages in other industries, the conditions respecting wages in different parts of the country, the special emergency respecting wages which exists at this time owing to war conditions and the high cost of living, as well as the relation between different classes of railroad labor.

"The commission shall begin its labors at once, and make report to the Director General, giving its recommendations in general terms as to changes in existing compensations that should be made.

"Officers, agents and employees of the railroads are directed to furnish to the Railroad Wage Commission upon request all information it may require in the course of its investigations."

In the statement Secretary Lane said:

"This commission understands that its duty is not to sit as a body of judges to determine a contested case as between the railroads and their employees. The government has taken over the control of the railroads for the period of the

war and to meet war needs. It is a matter of necessity that we secure from the roads their fullest usefulness. They must be made to play their part to the limit in the making of war, the carriage of goods and men. To this end it is fundamental that the employees shall feel that a spirit of justice animates the government. We should seek to give not what may be forced by contest, struggle, intimidation and coercion, but what is fair, all things considered. This is our attitude. We look at the problem before us as not, 'what does organized labor or unorganized labor demand,' but what with war upon us and living costs as they are, should be the compensation given for the services rendered. We seek for no counsel of perfection. The status of labor for all time is not to be determined by our studies. We shall not expect to give all that under pressure the workman might compel any more than we shall ask him to accept the wage that our soldiers receive for their unequalled sacrifice. But a working basis must be arrived at between the government and those who are employed on the roads by which good feeling shall be maintained and the fullest service obtained, for this is the prime need of the hour that each man's hand and brains shall serve the nation now as never before. We wish, in short, to stimulate production by doing what is just.

"This being a government inquiry we shall hear those who wish to contribute anything that is helpful, but it is mandatory that we shall reach a quick conclusion. Therefore the greater part of the data upon which we must act will be gathered for ourselves. There are 1,800,000 employees on our railroads. Some are organized and have great power for self-help. The great majority, more than two-thirds, are, however, not organized. We shall consider both classes, and upon an equal footing, so far as that may be practicable.

"This very statement of the number employed makes evident the unparalleled size of the task that is before us. If with this fact is considered the extent of the territory covered and the significance of the different conditions obtaining in the varying sections of the country it will at once be realized that no such hearing as this has been held before, nor one that carries such possibilities in affecting for good or ill the mass of our workers in all industries and the part they will play in carrying on the pressing duty of making war with characteristic American energy, enthusiasm and masterfulness. We wish first of all to know what present conditions are. What data have already been gathered as to the number of employees, their classification in groups according to their duties, their compensation in money and that compensation converted into terms of support for themselves and their families. This leads into a study of the present cost of living as contrasted with the cost at other periods. The various governmental agencies, the railroads themselves, the larger organizations of labor and individual studies will doubtless prove to have already gathered the greater part of these facts. Wherever there is a shortage this must be supplemented, and to this end we shall feel free to call upon railroads and employees, the government departments and other agencies for such facts as they can furnish.

"We shall also seek from foreign governments and from the industries of the country for the presentation of methods by which conditions such as we must meet have been met. In a word, we shall make this inquiry upon the broadest possible lines consistent with an early closing of our research, and the great body of the material we shall gather will, we trust, come to us in compact written or printed form rather than by oral statement. Each one who appears in person or otherwise shall be regarded as being animated by the same purpose that animates the government itself. No selfish or narrow ends are to be served by this hearing. We are looking to the greater welfare of the nation, and through service to the nation we seek the welfare of mankind. Our end is not to justify a theory or to reach or approximate an ideal, but rather as practical men to deal with a situation present in a spirit of fair-mindedness."

Telegraph Operators Ask Increase

Mr. Perham said he was appearing on behalf of telegraph operators, despatchers, station agents, telephone operators, levermen and similar classes of employees, of which there are 84,233. Of these about 50,000 are members of his organization. Secretary Lane brought out the fact that the organization is making a broader request of the government than when it was presented to the roads. Mr. Perham said that he had always followed the plan of dealing with railroads individually and that while the 40 per cent request was never presented to the roads committees are now negotiating with 20 roads, 3 mediation proceedings are under way and 1 arbitration proceeding. Seven roads had denied the petitions since the wage commission was created.

The employees he represents have never been adequately compensated, Mr. Perham said, but have always accepted compromises rather than go on a strike, although their wages are below those of other classes of labor. He read from the statistics of the Interstate Commerce Commission showing the average daily compensation of station agents, increasing from $1.73 in 1896 to $2.31 in 1913, and of telegraph operators and despatchers ranging from $1.93 in 1896 to $2.52 in 1913. In later years, he said the method of compiling the statistics has been changed and he read from the report of the Eight-Hour Commission showing the average compensation per hour in 1916 of train despatchers and directors, 55.6 cents; telegraph, telephone and block signal operators, 28.2 cents; telegraphers and station agents, 23.03 cents; telegrapher clerks, 25.04 cents; non-telegrapher levermen, 22 cents.

He said it had never been feasible to adopt a standard wage for telegraph operators and agents because of varying local conditions and varying degrees of responsibility, that station agents receive from $40 to $105 per month and that in some cases men receive higher pay than others for the same work.

Asked by members of the committee whether he considered the present relation of wages as between the various classes a proper one Mr. Perham said that if they could have their way they would like to have an increase amounting to 40 per cent and distribute it as circumstances seem to call for because some men ought to have more of an increase than others. He said it is usual for a road to agree to pay an increase amounting to a certain sum to be divided among the various divisions and among the individual men according to the circumstances of each case, and he believed this has resulted in a fair adjustment in general.

Mr. Perham said he assumed to represent all the employees in the classes represented by his order whether they are organized or not, and that the lowest wages are paid on the organized roads, although he said the Pennsylvania advances wages to keep men out of the organization.

He said that hundreds of agents and operators are working for as little as $38 a month, but when he was asked to file a list of such cases he thought he could not show so many because he was unable to get the exact figures for the unorganized roads. Chairman Lane asked him to file a statement showing the number of men in the various classes of employees receiving less than $50 a month, from $50 to $60, and so on by $10 stages. Mr. Perham suggested that these statistics be obtained from the I. C. C.

Representatives of the train despatchers appeared before the commission on Tuesday and of the maintenance of way employees on Wednesday.

The Board of Examiners will include Lathrop Brown, special assistant to the Secretary of the Interior; E. J. Barcalo of Buffalo, and Riley Redpath of Kansas City.

The Activities of the Railroad Administration

Economy of Expenditure of Operating Revenues Ordered. Federal Anti-Pass Law Applied to States.

WASHINGTON, D. C.

DIRECTOR GENERAL OF RAILROADS McADOO on January 28 issued his first order looking toward economy in the expenditure of railroad operating revenues during the period of the war. This was General Order No. 6, issued to officers and directors of railroad companies, as follows:

"During the period of possession, operation, and government control of railroads, it is necessary that officers, directors, and agents of railroad companies be very careful in the handling of moneys and in the dealing with transportation matters. Without attempting at this time to give general directions, there are a few matters involving the expenditure of moneys for purposes having no direct relation to transportation, which should receive immediate attention; as well as the issuance of free transportation.

"It is therefore ordered that the carriers' operating revenues shall not be expended:

"1. For the payment of agents or other persons who are employed in any way to affect legislation.

"2. For the employment of attorneys who are not actually engaged in the performance of necessary legal work for the company.

"3. For the payment of the expenses of persons or agencies constituting associations of carriers unless such association is approved in advance by the Director General.

"4. For any political purpose or to directly or indirectly influence the election of any person or an election affecting any public measure.

"No passes or free transportation shall be issued by any carrier under federal control or any official of such carrier unless the issuance of such free transportation is expressly authorized by the Act of Congress entitled 'An Act to Regulate Commerce, approved February 4, 1887, and Amendments thereto'; and any such passes or free transportation heretofore issued not in conformity with said act must be recalled.

"This order applies to all carriers under federal control, whether inter-state or intra-state."

The order as it applies to passes simply extends the provisions of the federal law to cover intra-state as well as interstate transportation. Some states have no anti-pass laws and the laws in many states are more liberal than the federal law, many of them allowing or even requiring railroads to give free transportation to public officials.

General Order No. 5, which preceded this order, was the formal appointment of the Railroad Wage Commission.

Blizzards Handicap Railroads

The Director General of Railroads and his staff have continued to devote most of their attention to problems created by the weather and the succession of blizzards and low temperatures has made it impossible to raise the embargo against general freight ordered on January 23 on the Pennsylvania, Baltimore & Ohio and Philadelphia & Reading, which it was expected would be in force but a few days. While one of the most serious conditions, the inability of ships to embark because of the delay in obtaining bunker coal, has been remedied, many of the eastern roads have been unable to handle much new freight except food, fuel and necessary government freight for several days and most of the reports received at Mr. McAdoo's office have been discouraging, while the daily reports of the Interstate Commerce Commission's inspectors from various terminal points, received by Commissioner McChord, continue to show conditions approaching a paralysis of transportation at many points, due to weather conditions, congestion in yards, shortage of crews, and engines and cars in bad order with a shortage of labor to repair them.

A. H. Smith, regional director in charge of the eastern lines, reported on January 26 that it had been necessary to suspend operations in Northern New York on account of a heavy snow storm and that on account of a very severe snow storm at Chicago all belt roads had discontinued accepting cars. Assurances that an adequate supply of cars will be furnished for the transportation of food supplies for export to the allies was given by Director General McAdoo at a conference with commissioners representing the British, French and Italian governments on Saturday and some discussion was given to the question of diverting more export freight to gulf ports.

Director General McAdoo has instructed, in the matter of embargo on the Pennsylvania Lines east of Pittsburgh, Baltimore & Ohio east of the Ohio River, and Philadelphia & Reading, that the following exceptions be made:

(a) Food for animals.

(b) Material used in the operation and upkeep of coal mines.

To provide for the rail movement of food and supplies consigned to the French, British and Italian governments, for ports on the North Atlantic seaboard, already accepted or under permit, arrangements have been made to consolidate these shipments and move them in solid trains, or groups of cars, east from Chicago, St. Louis and intermediate terminals.

Congestion on Pennsylvania

In addition to the daily reports from various terminals, Commissioner McChord, on January 29, issued the following statement, summarizing reports of the Interstate Commerce Commission's inspectors, relative to the congestion of freight traffic on the Pennsylvania Railroad and calling attention to the lack of any marked relief from the congestion on that line.

"A condition of serious congestion exists on the Pennsylvania Railroad in the Philadelphia district and in the Pittsburgh district and the line between is practically blocked with cars destined for those two points and beyond.

"In the Philadelphia yards the normal daily movement of cars is 2,925. The reports covering the period from January 14 to January 25, inclusive, except for January 19 for which no report was furnished, show that the maximum daily movement was 2,210 cars, and the average was less than 2,000. And on these same dates there were from 54 to 61 trains left over in the Philadelphia yards ready for movement but for which no locomotives were available. The number of cars left in the yards varied from 3,825 to 5,750. During this entire period there were from 1,400 to 2,200 empty coal cars in the yard for movement westward, and the number actually forwarded westward varied from 119 to 585 per day.

"On the Middle division, for movement in both directions, there were approximately 11,000 cars left over each day. While at times the business accepted by the Philadelphia and the Pittsburgh divisions was restricted, the traffic handled when not restricted by connecting divisions frequently did not exceed 50 or 60 per cent of the normal business.

"In the Pittsburgh district, the average number of trains

for which no locomotives were available in Pitcairn and Conway yards was more than 100 trains daily, and there were approximately 10,000 cars left over in those two yards each day.

"For four days on which the information was furnished, coal mines in the Pitcairn district were supplied with a very small percentage of empties required, in one instance 324 cars being required and only 24 furnished on account of no other empties being available.

"The principal cause assigned for the serious congestion on this railroad is shortage of motive power, but it is clearly apparent that the real cause is the impaired condition of motive power available, as well as the lack of adequate facilities for properly maintaining it, and excessive terminal delays. For example, the inspector reports that the facilities for maintaining the 149 locomotives assigned to Pitcairn are entirely inadequate, and only such repairs as are absolutely required are made, the demand for power being so great that minor repairs and other work which would greatly increase efficiency of locomotives are left undone; further, that even if more locomotives were assigned there, it is doubtful if they could be properly maintained or promptly handled. And at Altoona, on January 23, the report for that date being typical, all of the 50 stalls of the engine-house were occupied by locomotives undergoing repairs, 190 of the 230 locomotives despatched were repaired on inspection pit and storage tracks where there was no shelter or protection from snow and weather. Under such conditions, and in the crowded and unheated enginehouses existing at many points, some of which are too small to accommodate the large locomotives in use today, it is not reasonable to expect that necessary work can be promptly and efficiently performed. Vigorous action must be taken to improve the condition of motive power before relief can be expected."

Russian Locomotives

Former President Roosevelt, in an address before the National Press Club at Washington on January 25, criticised the administration for delay in obtaining the use of 200 locomotives built in this country for the Russian government, which have not been delivered to Russia because of the political situation.

"You all know the fuel shortage," he said. "You know it has been due largely to an insufficiency in the number of locomotives, and you know that ships needed to carry food to our troops in France have been at the docks for some weeks, because they could not load on account of the failure in locomotives. There are here 200 locomotives built for the Russian Government, and the Russian minister here, as I am informed, (and if necessary, if the question is queried, I will give my informants' names,) assented to our taking them. The Russian minister assented two months ago, and for eight weeks we have been leisurely discussing as to whether we could, under the circumstances, take these 200 locomotives and use them. I understand that the discussion is inching along to a favorable conclusion, and that in a few days, or a week or two, we will have the locomotives. But it will be two months after we ought to have had them. What I think, of course, in my views of the proper governmental policy, should have been done, was to take the 200 locomotives and then discuss."

It was announced some time ago that arrangements had been made for the use of the Russian locomotives by eastern railroads, but there has been some delay. Mr. McAdoo has stated, however, that they will be made available. It was planned that they should be used on the basis of a rental of $50 a day, which is the same basis on which locomotives will be used by the eastern railroads which will be delivered under orders from Mr. McAdoo for temporary use on those lines, regardless of who ordered them. The title to the locomotives will remain with the road that ordered them and it will receive the rental for the time until conditions are such that the locomotives can be delivered to the owning road.

Judge Payne Appointed General Counsel

Director General McAdoo announced on January 26 that Judge John Barton Payne, who has been acting as his legal advisor, has permanently retired from the firm of Winston, Payne, Strawn & Shaw, of Chicago, and has accepted appointment as general counsel to the director general of railroads. He has also severed all connection with railroad or other transportation corporations.

John Barton Payne was born at Pruntytown, Fauquier county, Va., January 26, 1855. He was educated in the private schools of Orleans, Va. At the age of 15 he became a clerk in a country store and studied law with the county clerk at Kingwood, Preston County, W. Va., being admitted to the bar there in 1876. In 1877, he was chairman of the Democratic committee of Preston County, and in 1880 was appointed a special judge of the circuit court of Tucker County, W. Va. In 1882 he was elected mayor of Kingwood. The following year he removed to Chicago, where he practiced law until 1893, in which year he was elected judge of the superior court of Cook County, Ill. He resigned from the bench in 1898, and shortly afterward became a member of the firm of Winston, Payne, Strawn & Shaw, which has represented the Chicago & Alton, Chicago Great Western and other roads. Judge Payne was for some years president of the Board of South Park Commissioners of Chicago and has devoted much of his time and means to the artistic betterment of that city.

John Barton Payne

Judge Payne is the only member of Mr. McAdoo's permanent staff, aside from the three regional directors, whose appointment has yet been announced. It is understood, however, that announcement will be made shortly of the permanent organization and that it will include Edward Chambers, Vice-president of the Atchison, Topeka & Santa Fe, in charge of traffic; John Skelton Williams, Controller of the Currency, in charge of financial matters; C. A. Prouty, Director of the Bureau of Valuation of the Interstate Commerce Commission, in charge of public service and accounts; W. S. Carter, President of the Brotherhood of Locomotive Firemen and Enginemen, in charge of labor matters, and Mr. Payne, in charge of legal matters.

Carl R. Gray, President of the Western Maryland, has been acting in charge of transportation matters for almost two weeks in the absence of Mr. Holden, and it is rumored that he will be permanently appointed. Another appointment is to be made in the maintenance and construction department. W. T. Tyler, assistant to the vice-president of the Northern Pacific, is acting as assistant to Mr. Gray. G. W. Kirtley, who has been assistant to Judge R. S. Lovett in his office as Director of Priority in Transportation, is acting as an assistant to Mr. Chambers, as the office of Priority Director is now practically obsolete.

The offices of the Railway Administration in the Interstate Commerce Building have displaced the Bureau of Valuation, which has been transferred to the building formerly occupied by Railroads War Board.

After conferring with representatives of shippers who had objected to certain features of the demurrage rules prescribed in general order No. 3, the Director General on Wednesday issued general order No. 7, making a number of modifications in the rules. The provision for using the average agreement is restored, but only for use in connection with cars held for unloading. It will not apply in the case of empty cars placed for loading. The number of days for which accrued debits will be considered will be four, instead of five as formerly. The regular demurrage rate, instead of increasing $1 each day will be $3 a day for the first four days after the expiration of the free time; $6 a day for the next three days, and $10 a day thereafter. The bunching rule will be restored, but with some modification.

The demurrage rules apply to carload freight except empty coal and coke cars placed for loading, or under load, export freight awaiting ships, coal for transhipment at tidewater or lake ports, and empty private cars stored.

Louisiana congressmen, the mayor of New Orleans, and officers of the New Orleans municipally-owned Public Belt Railroad have been very busy trying to find out whether the road had been or would be taken over by the government. Mr. McAdoo finally referred the question to C. H. Markham, regional director for the Southern roads, whose headquarters are at Atlanta, Ga., who decided that it was not needed by the government.

Mr. McAdoo on January 24 met delegates representing the railroad department of the American Federation of Labor, the Brotherhood of Railroad Signalmen, and the organizations of boiler makers, electrical workers, sheet metal workers, car repairers, blacksmiths and machinists. Their requests for increased wages have been referred to the Railroad Wage Commission.

It was stated in last week's issue that J. F. Holden, vice-president in charge of traffic of the Kansas City Southern, has been appointed supervisor of transportation and traffic of the United States Shipping Board. This statement was slightly in error. Mr. Holden has been appointed by Director General McAdoo as an assistant to Edward Chambers, his traffic adviser, and he will have general supervision over the transportation of the supplies and materials for the Shipping Board and relations between the railroads and the Shipping Board, but as a member of Mr. McAdoo's staff rather than of that of the board.

Passenger Traffic and Labor Supervision Discussed

Western Railway Club Has Paper on Organization Maintenance and Address on Traffic Problems

THE MONTHLY MEETING of the Western Railway Club was held at the Hotel Sherman on January 21. A. R. Ayres, superintendent of motive power of the New York, Chicago & St. Louis, read a paper on Organization Maintenance, and P. S. Eustis, passenger traffic manager of the Chicago, Burlington & Quincy, gave an informal talk on the Passenger Traffic Problem of Today.

Mr. Eustis' Address

Mr. Eustis spoke in part as follows: "If we would find the causes of the present trouble on the railroads we must look back. When the European war broke out, the roads were unprepared. They had no surplus facilities because they had had no surplus earnings to put into the properties and could not get capital from other sources to take care of the needed expansion. The main trouble was too much regulation and lack of confidence. Manufacturers too were not prepared for the enormous orders that came, and the ships and docks and mines were unable to take care of the demands made upon them. The industries of this country have always lived from hand to mouth. They keep stocks of fuel and supplies to last but a very short time. The mines did not work at full capacity during the summer, and the country had come to think that strikes of miners during that period were of no consequence. This has been largely responsible for the shortage of fuel we are now experiencing.

"The amount of work done since the war started is wonderful, considering how poorly prepared this nation was. The railroads operating under the direction of the War Board were still hampered by the restrictions of State and Federal bodies. Yet in 1917 they moved 27 per cent more freight per car than ever before. At the same time there was a great increase in passenger traffic, varying on individual roads from 10 to 70 per cent. The passenger traffic of the entire country is probably 25 per cent greater than at any previous time. A great deal of this increased traffic has been in one section, and it is not to be wondered at that there is congestion in the east.

"One of the greatest mistakes the railroad men could make would be a failure to back Mr. McAdoo in his railroad directorship. If Mr. McAdoo doesn't manage to work out some plan that will make government directorship a success, then look out that officials don't charge you with having obstructed his work.

"One of the difficulties that will be met in unifying the roads is due to the fact that the carriers, because of competition, have furnished better service for less money in this country than anywhere else in the world. If we try to do away with part of this service there will be strong opposition. Nevertheless, we should save coal by running only the passenger trains that are needed."

Organization Maintenance

By A. R. Ayers,
Superintendent Motive Power, N. Y. C. & St. L. Ry.,
Cleveland, Ohio.

One of the greatest problems before the railroads, as a result of the present intense industrial activity, is that of keeping up their organizations to a point which will accomplish the necessary results. Chief among the factors which make this problem difficult is the constantly changing personnel of the organizations, brought about by officers and foremen as well as workmen leaving railroad service for military or industrial occupations. For many years railroads have been operated by men of long experience in that particular work; the workmen as well as those in supervising capacities were thoroughly familiar with the details, and properly handled most situations as a matter of routine and with very little detailed instruction. This brought about a situation, where the proper handling of a given task was frequently put up to the workman to whom it was assigned with practically no detailed instruction from the man who assigned the work; the workman was supposed to know his business.

Conditions have changed in recent months, and all over the railroad we are doing the work with men who, in many

cases, have had no previous railroad experience; this applies to the road work as well as shop work. This condition makes a heavy burden on supervision and it is necessary for supervision to change its methods materially; the work can no longer be put up to the man without instruction. When a man lacks previous experience, or perhaps lacks initiative, it is necessary to instruct him in detail concerning the work which he is to do, and in many cases even supervising officers and foremen, who may be new in their present positions, do not understand very definitely just what is expected of them.

Difficulty in getting results is sometimes ascribed to indifference on the part of the men, and while this may be so in many cases, it is also true that much of the difficulty is due to lack of experience of the men, and lack of proper supervision and instructions. There are many conditions existing in shops and engine houses which were not very strongly objected to by the old timers, who were used to them, but which contribute quite largely to indifference and inefficiency on the part of the new and inexperienced employees. Some of these conditions are, poor light, lack of sufficient heat, poor floors, lack of proper small tools and worn out machinery. Men who are used to working with labor saving devices do not take kindly to places where they have to do the same work by main strength and awkwardness.

There is no question that a much heavier burden has been placed on our supervision, on account of the necessity of giving detailed instructions to new men, which were not required with the older men, and where this has been recognized, and where the supervising force has been organized to meet the conditions, excellent results may be obtained which will more than repay the additional expense.

The continual changing of the working force, requiring the constant educating of new men, requires more than usual courage, resourcefulness, cheerfulness and enthusiasm on the part of the foremen, as well as ability in their particular kind of work. Nothing is more important at this time than to inspire these qualities in the men who are close to the firing line.

In the present emergency, I am prompted to quote from the address of J. F. Deems, when he was president of the American Railway Master Mechanics Association in 1907: "We may work in brass and steel and leave the most perfect mechanism; we may develop and improve and evolve methods and practices until nothing more can be desired; we may reach perfection in all these, in mechanism, structure and method, and yet our bequest be a failure and itself a burden unless we provide that which is paramount, which is over and above the sum total of all this, and for which, even today, events throughout the world are crying aloud—the man. A man prepared, experienced, earnest; hopeful and happy; consecrated to his work and ready to the hand of the future." There are many such men in our organizations; some of them we know, others we have not yet discovered, and it is up to us to know that our working conditions in shops and on the road are the best that can be afforded, that our supervision is ample and capable, so that men will understand their duties and will be happy, contented and enthusiastic in the performance of them, in order that nothing may be left undone to give our last ounce of energy in supporting this Government and those who are fighting for us to win this war.

Discussion

The consensus of opinion was that there is need for an increased number of foremen at this time. Less supervision is required where the piece work system is in effect than where the men are on day work. Some stated that it was impossible to get men to stay on the work long enough to train them. A. R. Kipp (Soo Line) brought out the fact that the workers at this time have not the same spirit as formerly and it will take a different kind of supervision to secure results. As there is a spirit of carelessness and indifference in the workers, the foremen must put in a personal touch to give them inspiration and incentive. T. H. Goodnow (C. & N. W.) expressed the opinion that the seniority rule makes it very difficult to secure foremen and often makes it impossible to get the best men who could be chosen in supervisory positions. The organization and rules of the unions have removed the ambition which workers formerly had. Another difficulty is due to the fact that the majority of men now doing the work in some departments are foreigners. With the shortage of labor and the attitude of the labor organizations it is difficult for the foremen to secure results. The men in the higher positions should uphold the foremen in order that they may secure the support of the men in the ranks.

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Showing How the Railway and Motor Truck Are Co-ordinated Behind the British Lines

Report of the Eight-Hour Day Commission

Wage Increase Resulting from Adamson Law Estimated at $61,000,000. Some Reductions in Hours

WASHINGTON, D. C.

A BRIEF SUMMARY was published in last week's issue of the report submitted to the President and Congress by the Eight-Hour Commission, General George W. Goethals, Edgar E. Clark and George Rublee, appointed by the President under the terms of the Adamson law. The following is an abstract of the text of the report, which is accompanied by nearly 500 pages of appendices, including statistical exhibits, and the reports of the commission's special agents on topics connected with the investigation.

This commission is directed by law to observe the operation and effects of the institution of the eight-hour standard work day established for certain railroad employees during a period of not less than six months nor more than nine months, in its discretion, and to report its findings to the President and Congress within 30 days thereafter. The law does not state when the period of observation shall begin. If this period was intended to begin with the legally effective date of the eight-hour standard day, January 1, 1917, the report would have been due not later than October 31, 1917. By reason of occurrences beyond the control of this commission, it was not possible to make a satisfactory report by October 31, 1917. We had to decide whether, in pursuance of a strict construction of the statutory direction, we should, on that date, make a report which, for lack of information, could have little, if any, value, or whether we should wait until we could obtain a sufficient body of the statistics to give weight to our findings and enable our report, in some measure at least, to fulfill the purposes which Congress had in contemplation. After careful consideration it seemed to us that we were justified in taking such additional time as would be necessary to complete a reasonably informative report. Early in October, however, it seemed probable that the relations between the brotherhoods and the railroads would again come prominently into public notice before the close of the year. Under these circumstances we concluded that it would be best to transmit our report in December, even though it would be in many respects incomplete.

A brief statement of the events leading to the enactment of the law creating the commission is here inserted to make clear the nature and extent of its duties.

Scope of the Duties of the Commission

The commission is directed to report the operation and effects of the institution of the eight-hour standard workday and the facts and conditions affecting the relations between common carriers and employees. This language is broad enough to authorize an encyclopedia on railroad labor, but it seemed to the commission that it could reasonably be expected to deal only with topics connected with the proposal to insert an eight-hour basic day in the wage schedules as the time measure of a day's work, and with topics connected with the proposal of the roads. This indicated that there should be shown the increase in wages resulting from the law, as well as the actual hours and wages paid, by classes of service and occupations; the relation of "straight" time and overtime payments and arbitrary allowances; a description of the leading features of the wage schedules; the conditions of train operation which result in overtime, and the possibility of eliminating those conditions; and, finally, a description of the conditions under which train and engine crews work. This view eliminates the question of the reasonableness of the present wages, as well as the question of the financial condition of carriers as bearing upon their ability to pay an increase. These excluded questions it did not seem possible to deal with adequately. To determine whether the increases made as a result of the eight-hour law were justified would be to decide again a question already settled by negotiation, and to attempt to determine whether further increases would be reasonable in advance of a demand for them would be futile.

Consideration was given to the advisability of including in this report a study of the trend of wages of train and engine crews in relation to changes in ton-miles, car-miles, and train-miles. A beginning on such a study was made, but it appeared that an adequate treatment would require such a comprehensive investigation of railroad operations and of the financial conditions of carriers over a series of years that the project was abandoned on the ground that no thorough and conclusive showing could be made, and also on the ground that this matter had to do with the reasonableness of increases in wages. After it is conclusively shown whether wages per locomotive-mile or per ton-mile have increased or decreased, it still remains to be decided what is the significance of the showing. How much increase in the wages per locomotive-mile are required to compensate for the increased fatigue or hazard of operating the larger locomotives? If the tonnage of a train is doubled, in what proportion should the wages of the crew be increased? An answer to such questions we think is outside of the province of this commission.

Plan and Progress of Commission's Work

The President appointed the members of this commission on October 11, 1916. At a conference held on November 23, 1916, the railroad executives present agreed to give all necessary information, and at a conference held on November 28, 1916, the chief executives of the brotherhoods also expressed a willingness to co-operate. At the request of the latter, the headquarters of the commission were transferred from New York City to Washington, D. C., as the men whom they expected to appoint as their representatives to assist in checking the returns of the companies could not leave Washington. The railways have been represented before the commission by a sub-committee of the National Conference Committee of the Railways, A. S. Greig, C. P. Neill, J. G. Walber, and J. W. Higgins. The brotherhoods appointed W. J. Lauck and F. J. Warne as their representatives, with authority to go over the work of the commission from month to month and approve it. These representatives met from time to time during December, January, and February in conference with the secretary of the commission, and a series of forms to be filled out by the railways were agreed upon.

It was impossible for carriers to fill out these forms until after the provisions of the eight-hour law, which is general in its terms, had been made definite by judicial interpretation or by agreement of the parties.

The railroads in November and December, 1916, instituted many suits to enjoin the enforcement of the law. By a stipulation between the attorney general of the United States and counsel for the railroads, a consent order was entered continuing all of these cases, except one, which was made a test case. The final determination of this case was to be expedited as much as possible. The roads agreed to keep their books and accounts in such a manner that if the constitutionality of the act was upheld the men could be paid

from January 1, 1917, in accordance with the terms of the law. This meant, in practice, merely that the roads kept the time slips showing the service performed by each man. The calculations of the pay on both the old and new bases could not be made currently, because the very general terms of the law could not, without interpretation, be applied to individual schedules.

The case was argued before the Supreme Court of the United States on January 8, 1917. Before the case was decided, the brotherhoods again threatened to strike if a settlement was not effected at once without waiting for the decision of the Supreme Court. The strike was to begin on March 17 at 7 p. m. The President of the United States appointed a committee, representing the Council of National Defense, and consisting of Hon. Franklin K. Lane, secretary of the interior; Hon. William B. Wilson, secretary of labor; Daniel Willard, president of the Baltimore & Ohio Railroad; and Samuel Gompers, president of the American Federation of Labor, to effect a settlement of the controversy through mediation. At the request of that committee, the date of the strike was postponed until March 19. Early on the 19th a settlement was effected in harmony with the eight-hour law, but defining somewhat more specifically the application of the eight-hour basis to existing schedules and practices. On the same day, March 19, the decision of the Supreme Court of the United States upholding the constitutionality of the law was handed down. The award above mentioned provided for a "Commission of Eight," four members representing the brotherhoods and four the railroads, to decide disputed questions arising thereunder. This body found it necessary practically to rewrite the schedules for the entire country. Negotiations were continued during the summer, the decisions of the Commission of Eight not being completed until September 23, 1917. The eight-hour day as the measure of a day's work for the purpose of reckoning compensation of certain classes of railroad employees has thus become an accomplished fact. We do not understand that the roads have any intention of further contesting the establishment of the eight-hour day for the employees concerned in the negotiations.

During the months of deliberation by the Commission of Eight, the work of filling out the blanks agreed upon was retarded. Some of the returns included in this report were received as late as November 10.

In addition to the information to be entered on the blank forms agreed upon, the commission proceeded to collect information through three special agents on the following topics: (1) Railway wage schedules and agreements; (2) employment conditions in road and yard service; and (3) the practicability of an actual eight-hour day in railroad train service. These topics were assigned respectively to William Z. Ripley, Victor S. Clark, and Charles P. Howard. Their reports are described in subsequent sections, and are printed in full in appendixes. Although the commission exercised care in selecting men of impartiality and of scientific standing for these special reports, and made suggestions as to their plan and scope, the reports themselves should be taken as representing the individual views of their authors.

Railroads and Classes of Employees Affected

It is not possible for this commission to make authoritative findings as to the ultimate effects of the eight-hour standard workday. In the first nine months of 1917 traffic conditions were in many respects abnormal. Furthermore, it takes some time for railroads to adjust themselves to these new conditions. It will require further study by others in the future to make anything like a final showing. Nevertheless, we believe that certain truths regarding the operation of the eight-hour law are now apparent, and the presentation of such facts as have been collected will be of some service.

(1) *The roads included:* The law applies to all common carriers by railroad subject to the act to regulate commerce with the exception of railroads independently owned and operated not exceeding 100 miles in length, electric street railroads and electric interurban railroads, such exceptions, however, not applying to certain terminal and transfer roads. "One hundred miles in length" presumably means first track mileage operated under any form of ownership or contract, so long as the ownership and operation are independent. "Independently" here probably means independently of some parent or controlling company. The roads excluded from the above exception and thus subject to the law are those whose principal business is leasing or furnishing terminal or transfer facilities to other railroads; or which are themselves engaged in transfer of freight between railroads or between railroads and industrial plants. This, taken strictly, would leave very few if any steam roads excluded, since probably nearly all roads make interchanges of freight between other roads. The exact determination of this matter must be left to the courts. In order not to increase the extent of the commission's correspondence uselessly, it was decided to address only the roads which reported to the Interstate Commerce Commission and which were 100 miles or more in length, or were classed as switching and terminal companies, as well as roads less than 100 miles in length if known to be parts of larger systems.

(2) *The employees included:* Neither the eight-hour law nor the decision of the Supreme Court makes an enumeration of the classes of employees affected. The terms of the law are general. It applies to persons actually engaged in any capacity in the operation of trains used for the transportation of persons or property. The restrictions to trains transporting persons or property is of no practical importance, since it is customary to pay engineers, for example, at the same rate whether their engines run light or loaded.

In a broad sense, nearly all employees of railroads are engaged in the operation of trains, that being the business of a railroad; in a more restricted sense, the language of the law might apply to all persons connected with the movement of trains, directly or indirectly, including not merely the enginemen and trainmen, but also the telegraphers who send messages controlling the movement of trains. In a still narrower sense, the law might be understood to apply only to those physically on moving trains and having something to do with their operation. The narrowest view might exclude yard employees as engaged in making and breaking up trains but not in operating them, and it might also exclude hostlers.

The railroads have taken the view that the act does not apply to employees other than those who were represented by the brotherhoods in the negotiations which led to the passage of the law, and in fact only the latter classes are recognized by the roads as entitled to its benefits.

It is a fact, however, that the demands of the brotherhoods related to freight service only, while in its actual application, the eight-hour law has affected the passenger service also. It clearly applies to that service. We must look to the language of the law as well as to the negotiations between brotherhoods and railroads to find out what the law means in detail, the classes of employees threatening to strike at a particular time affording the general basis for classification, and, as the Supreme Court has ruled, an adequate basis. In other words, Congress, although moved to legislate because of a crisis affecting certain employees, may be assumed to have made a logical classification in framing the act. The proper interpretation of the words, "actually engaged in any capacity in the operation of trains," must be left to the courts.

This commission has received inquiries whether such employees as switch tenders and car inspectors are entitled to the eight-hour basis, but no definite answer could be given in advance of interpretation by the courts.

We find that the roads in actual practice have applied the eight-hour day as a basis for reckoning the compensation of the following classes of employees: Engineers, firemen, con-

ductors, assistant conductors, baggagemen, brakemen, and flagmen in road and yard service, and generally also hostlers. The average number of the employees in these classes, including a small number classified as "Other road train employees," in the calendar year 1916, was 308,373, which was 17.37 per cent of the total number of railway employees. This refers to the large roads, having annual operating revenues of more than $1,000,000. The corresponding percentages in the three geographical districts are: Eastern, 17.69 per cent; southern, 17.45 per cent; and western, 16.86 per cent. The aggregate number of employees in the eastern district is in excess of those in the South and West combined.

The aggregate compensation paid during the year 1916 to the employees above mentioned was $410,743,044, which was 28.11 per cent of the compensation paid to all railroad employees. The corresponding percentages in the three geographical districts are: Eastern, 29.19 per cent; southern, 27.71 per cent; and western, 26.93 per cent.

Effect of Eight-Hour Law Upon Wages and Hours

(1) *The Increase in Cost to the Railroads.*—At the time the eight-hour law was being considered, there was much speculation as to the extent of the probable effect upon railroad operating costs. Obviously, the increase in cost in absolute figures will vary from year to year with the volume of traffic. We cannot do more than to state what the increase would be if the percentages derived from observations during a limited period are applied to a year's business.

The following table shows the increase in pay due to the eight-hour law as reported for the month of January, 1917, and the percentage relation to the compensation under the 1916 schedules of wages. The table covers 104,355 miles of road, of which 20,093 were in the eastern district, 24,502 in the southern, and 59,760 in the western.

COMPENSATION UNDER EIGHT-HOUR LAW AND UNDER 1916 SCHEDULES, BY DISTRICTS, SO FAR AS REPORTED: MONTH OF JANUARY, 1917.

[This table covers 104,355 miles of road.]

District and service.	Compensation under 1916 schedules.	Increase due to 8-hour law.	Per cent of increase.
Passenger:			
Eastern	$1,131,579	$48,048	4.246
Southern	554,186	10,027	1.809
Western	1,260,141	22,349	1.774
Total	2,945,906	80,424	2.730
Freight:			
Eastern	2,955,414	567,046	19.187
Southern	1,674,594	181,559	10.841
Western	2,974,305	394,168	13.252
Total	7,604,313	1,142,773	15.028
Yard:			
Eastern	2,139,249	531,940	24.866
Southern	651,590	153,287	23.525
Western	1,218,136	300,576	24.675
Total	4,008,975	985,803	24.590

If the percentages shown in the preceding table are applied to the total compensation paid to these same classes of employees for the calendar year 1916, the following estimate of total increase in wage cost results: Passenger service, $2,532,097; freight service, $31,668,998; yard service, $27,333,437; total for the United States, $61,534,532. This does not include increases paid to hostlers, which would amount to about $1,875,000 additional, if all roads paid hostlers on the eight-hour basis, the increase for this occupation being generally nearly 25 per cent for January, 1917. The foregoing estimates relate to "Class I" roads, or those having operating revenues of more than $1,000,000 per annum. The approximate correctness of the percentages shown above is indicated by a study of the amount of the back-pay checks due employees during the months of January and February, 1917, in relation to the pay rolls of those months.

But the estimate is subject to certain qualifications. It does not include the increases which may be granted to miscellaneous employees who come in contact with yard employees and who are asking why they should not receive the same treatment.

Again, the significance of the estimate will be questioned by those who believe that conditions in January of this year were abnormal in the amount of overtime, and by those who believe that the carriers will find ways of adjusting their operations so as to avoid paying overtime.

The wide difference between the per cent of increase in the eastern as compared with the southern and western districts indicates that an increase of facilities or other adjustments may reduce the amount of overtime.

Actual experience has demonstrated that the showing for the first month of 1917 is subject to modification. First, in yard service there has been a wide-spread change to eight-hour shifts. Reports in answer to our circular of inquiry dated October 5, 1917, covering 175,744 miles of road, show that between January 1, 1917, and the date of the reports, 11,390 yard crews were placed on eight-hour shifts, and at the time of the reports 3,486 crews were still working longer than eight hours. To what extent this change will be permanent, we do not know, but a reduction in hours means to the men that they do not get the wage increase indicated above, and in some cases it means a considerable decrease, as where men formerly working 12 hours now work 8 hours for the former 10 hours' pay. To the carriers, however, the reduction in hours does not necessarily mean an escape from all of the increased cost shown in January. With a 25 per cent increase in pay per hour the total labor cost must be increased unless the total number of man-hours required for a given amount of switching is reduced through increased efficiency. There may be additional economies in the use of the equipment or facilities. The general change to the eight-hour shift has been so recent that it was not practicable for this commission to undertake a special study of the effect of reduced hours on efficiency. We can make no finding as to how much the percentage of increase in labor cost shown for yard service can be reduced.

In road service, actual experience has shown a much less marked change in operation, but, considering the repeated statement of representatives of the railroads that train operation would not be affected by the eight-hour law, the replies of the carriers were somewhat surprising in revealing hundreds of instances of an actual shortening of the hours of road employees. The replies of the carriers in answer to the questions in regard to changes in operation are reprinted in full in Appendix IV. That of the Baltimore & Ohio is here given as being of especial interest:

The time of freight trains has been changed as a result of putting on additional trains, resulting in some cases in the shortening of the mileage, and in other cases the additional train service takes care of a portion of the work in order to relieve the regular crews to the extent of shortening their time between terminals. Working time table schedules have been increased which increased the speed of the trains. Tonnage has been reduced. Turn-around freight service has been changed to straight-away service, which has shortened the time on duty per trip. The time of approximately 103 trains per day has been changed as a result of the foregoing. The following is a comparison of distance and hours per train run which indicates the effect of the changes above mentioned:

	Freight trains run.	Miles per train.	Hours per train. Hrs.	Min.
July, 1916	22,829	87	10	13
July, 1917	25,513	84	9	42

Helper service has been discontinued at some points and trains have been run as double-headers to shorten the time on duty per trip. Better classification of freight is being made in yards to reduce the switching on line of road. Yard engines have been put on at outlying points to reduce the amount of

switching performed by crews of freight trains. The following is an illustration of the performance on one of the divisions where helpers were discontinued and double-headers operated:

Trains.	Time consumed per train. Initial yard. Hours.	Road. Hrs.	Road. Min.	Final yard. Hours.	Total. Hrs.	Total. Min.
July, 1916	37	9	06	24	10	07
July, 1917	35	7	12	21	8	08

The Increase in Wages in Each Occupation and Class of Service

The foregoing discussion is based upon aggregates of the wage increases in passenger, freight, and yard services. It is important to show also the increases in the various occupations in each sub-class of service. Illustrative results are shown in the following table:

PER CENT OF INCREASE IN COMPENSATION UNDER EIGHT-HOUR LAW IN EFFECT JAN. 1, 1917, AS COMPARED WITH COMPENSATION PAID UNDER 1916 SCHEDULES, FOR SELECTED ROADS: MONTH OF JANUARY, 1917.

Class of service and occupation.	Eastern district.						Southern district.					Western district.				
	Pennsylvania R. R. Co.	New York Central R. R. Co.*	Lehigh Valley R. R. Co.	Cleveland, Cincinnati, Chicago & St. Louis Ry. Co.	Central R. R. Co. of New Jersey.	Delaware & Hudson Co.	Southern Ry. Co.	Louisville & Nashville R.R. Co.	Seaboard Air Line Ry. Co.	Central of Georgia Ry. Co.	Mobile & Ohio R. R. Co.	Atchison, Topeka & Santa Fe Ry. Co. (eastern lines).	Great Northern Ry. Co.	Chicago, Rock Island & Pacific Ry. Co.	Missouri, Kansas & Texas Lines.	Chicago & North Western Ry. Co.
Passenger, through:	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
Engineers	0.4	0.1	1.5	0.2	(a)	0.3	0.2	0.6	(a)	2.0	(a)	(a)	0.9	0.1	0.6	(b)
Firemen	.7	.3	1.9	.2	(a)	1.6	.4	.9	(a)	1.9	(a)	(a)	.9	.1	.5	(b)
Conductors	.6	.8	2.0	.5	(a)	6.2	1.8	1.2	(a)	1.4	(a)	0.1	(b)	.4	.9	0.2
Assistant conductors (ticket collectors)																
Baggagemen	.7	1.1	1.9	.3	(b)	4.1	1.9	.....	(a)	.4	(a)	(a)	.....	.....	.....	.1
Brakemen and flagmen	.8	.7	2.7	.5	(b)	9.7	1.5	1.7	(b)	1.0	(a)	.1	(b)	.3	.4	.1
Total	.6	.5	2.0	.3	(b)	4.5	.9	1.0	(b)	1.6	(a)	(b)	.5	.2	.6	.1
Passenger, short turn-around:																
Engineers	6.9	4.9	5.3	12.8	13.2	7.4	7.2	14.3	(a)	20.8	5.0	(a)	4.5	15.8	2.2	10.1
Firemen	8.4	5.0	7.9	9.7	14.6	6.8	7.2	14.2	(a)	21.2	5.7	(a)	4.7	9.0	2.3	9.1
Conductors	7.5	8.8	14.8	14.4	7.5	6.4	10.3	8.9	(b)	27.2	3.5	(b)	.1	17.8	31.8	19.1
Assistant conductors (ticket collectors)						1.6										29.2
Baggagemen	9.8	13.7	14.3	20.8	6.3	7.4	11.1	.....	(a)	17.0	7.2	.....	.....	.....	.....	16.9
Brakemen and flagmen	11.0	8.5	13.4	18.2	7.5	7.8	11.7	14.9	(a)	20.2	4.0	.1	(a)	14.0	18.6	22.6
Total	8.3	7.4	10.3	13.7	10.3	7.0	8.8	12.7	(b)	22.4	4.7	(b)	2.8	14.7	10.6	16.3
All passenger service:																
Engineers	3.1	.9	2.8	1.2	8.6	3.4	.8	4.5	(a)	3.3	.4	(a)	1.1	2.2	.7	2.9
Firemen	3.6	1.0	3.7	1.0	9.5	3.9	.9	4.7	(a)	3.2	.4	(a)	1.1	1.1	.6	2.6
Conductors	3.5	2.5	6.4	1.8	5.1	6.3	2.4	4.1	(b)	3.3	.5	.1	(b)	3.1	2.7	5.4
Assistant conductors (ticket collectors)						1.6										29.2
Baggagemen	5.0	3.4	6.1	1.4	4.1	5.5	2.6	.....	(a)	.9	.7	(a)	.....	.....	.....	3.5
Brakemen and flagmen	4.6	2.0	6.7	1.6	5.5	9.2	2.3	6.4	(b)	2.6	.6	.1	(b)	2.7	.9	6.6
Total passenger service	3.8	1.7	4.9	1.4	7.0	5.5	1.6	4.7	(b)	3.0	.5	(b)	.6	2.2	1.2	4.9
Freight, fast:																
Engineers	9.2	5.2	6.0	12.1	14.6	14.2	2.0	1.5	1.1	c.4	1.8	4.4	(a)	7.5	.....	5.0
Firemen	10.6	4.0	6.7	11.2	14.5	14.0	2.3	1.2	1.6	.4	2.1	4.3	(a)	7.5	.....	4.2
Conductors	8.5	2.8	5.4	10.6	15.1	14.6	.9	3.0	2.3	c.2	1.4	3.8	(a)	5.6	.....	3.6
Brakemen and flagmen	8.4	2.4	5.7	10.8	15.1	14.8	.9	3.3	1.5	.3	1.3	3.6	(a)	5.2	.....	3.4
Total	9.0	3.5	5.9	11.2	14.9	14.5	1.5	2.2	1.5	(d)	1.7	4.0	(a)	6.4	.....	4.2
Freight, slow:																
Engineers	18.5	17.7	23.3	18.5	23.1	23.4	7.4	2.7	3.3	.2	3.1	11.7	16.1	13.3	8.2	9.6
Firemen	19.0	11.8	20.0	16.1	23.0	23.5	7.8	2.9	3.6	.4	3.4	11.9	15.4	11.6	8.1	10.0
Conductors	19.4	16.3	19.5	16.3	23.4	23.3	7.0	5.6	2.8	c.3	2.2	10.9	17.2	11.1	8.7	9.5
Brakemen and flagmen	18.4	16.0	18.8	18.7	23.1	23.6	6.9	6.1	5.8	c.3	1.7	10.9	17.3	11 6	8.8	9.1
Total	18.7	15.6	20.3	17.6	23.1	23.5	7.2	4.5	3.8	(d)	2.6	11.4	16.5	12.0	8.5	9.6
Freight, local:																
Engineers	19.0	24.5	23.3	22.1	24.1	22.7	21.2	17.0	21.2	22.5	17.7	21.8	17.3	18.5	21.4	21.4
Firemen	21.1	23.6	23.5	22.2	23.9	22.6	20.8	15.7	24.7	24.9	18.5	21.7	16.9	19.1	20.8	19.3
Conductors	21.0	23.5	22.0	21.6	23.1	22.6	21.1	16.3	23.3	23.3	18.4	21.7	17.7	18.0	25.5	20.3
Brakemen and flagmen	19.8	23.6	22.1	20 6	23.2	22.1	21.7	17.8	22.1	22.3	17.8	20.7	18.0	16.8	25.6	19.6
Total	20.1	23.8	22.6	21.4	23.5	22.4	21.3	17.0	22.4	22.9	18.0	21.4	17.6	17.9	23.7	20.2
Total freight and miscellaneous service:																
Engineers	18.3	20.6	20.4	18.7	22.3	22.3	14.1	7.2	9.8	9.4	6.4	12.5	16.3	13.9	13.6	13.3
Firemen	18.9	16.8	19.6	17.0	22.1	20.6	14.1	7.3	10.9	10.6	6.3	12.4	15.8	12.8	13.2	12.9
Conductors	19.2	19.3	18.3	16.9	22.0	22.0	14.4	9.2	11.9	11.0	6.9	12.0	17.4	12.3	16.0	13.4
Brakemen and flagmen	18.3	19.0	18.4	18.4	21.9	21.9	15.0	10.8	13.1	11.9	7.8	12.2	17.6	12.5	17.0	13.6
Total freight and miscellaneous service	18.6	19.0	19.1	17.9	22.1	21.8	14.5	8.8	11.3	10.7	6.9	12.3	16.8	12.9	15.1	13.4
Yard:																
Engineers	24.9	24.7	24.5	24.9	25.0	24.6	22.7	24.3	21.5	24.5	22.1	24.4	24.3	22.6	24.4	24.6
Firemen	24.9	24.9	24.4	25.0	25.0	24.4	24.5	24.0	21.5	24.3	23.2	24.1	24.2	26.7	24.4	24.7
Conductors (foremen)	24.8	25.0	24.6	25.0	24.6	24.7	24.5	20.5	25.4	24.7	25.4	25.0	25.0	26.0	24.6	24.9
Brakemen (switchmen and helpers)	25.1	25.0	24.7	24.8	24.4	24.6	25.0	21.1	18.2	24.5	25.0	25.1	25.0	22.0	24.7	25.5
Total yard service	25.0	24.9	24.6	24.9	24.7	24.6	24.3	22.1	21.3	24.5	24.0	24.7	24.7	23.7	24.6	25.0
All services:																
Engineers	16.8	18.2	18.5	16.2	19.7	20.1	11.9	10.3	9.0	10.1	8.4	11.5	13.6	12.3	11.4	13.4
Firemen	17.5	17.4	18.4	15.6	20.0	19.2	12.4	10.3	9.3	10.5	8.5	11.6	13.3	12.1	11.2	13.0
Conductors (including yard foremen)	17.4	19.2	18.2	16.7	18.9	20.2	13.7	11.2	11.3	11.2	10.1	12.8	14.6	12.7	14.2	14.6
All other trainmen	19.5	20.3	19.3	18.7	20.0	21.1	15.5	13.8	11.3	13.4	12.0	16.1	16.8	14.1	18.4	16.4
Total road and yard service	18.1	19.0	18.8	17.0	19.7	20.3	13.5	11.7	10.2	11.4	9.8	13.1	14.7	12.8	14.0	14.6

* Syracuse, Rochester, and Buffalo divisions only.
a No increase or decrease.
b Less than one-tenth of 1 per cent increase.
c Decrease.
d Less than one-tenth of 1 per cent decrease

It will be seen that here again the heaviest increase appears for eastern roads. In the main, the increase in through passenger service is slight, but in the short turn-around service it is substantial. Short turn-around or suburban service was intended to include those turn-around passenger runs on which the distance in either direction does not exceed 80 miles, although one road reports that it drew the line at 50 miles. In slow freight and local freight services the increase is decidedly heavier than in fast freight service. Fast freight service was defined to include trains actually operated with reduced tonnage to make possible a rate of speed higher than that of ordinary slow freight for the purpose of making required deliveries or connections with other trains, regardless of whether designated as fast freights, symbol trains, red ball, or other special designations. The increase shown for yard service is subject to the qualifications noted.

In order to determine whether the percentages for January were representative, carriers were asked to give data for engineers only for the months of March and May. Such returns as have been received indicate that the percentages of increase are similar from month to month for the same road in the same sub-class of service, except where they reflect the change to the eight-hour shifts in yards, beginning on some roads in May. In this connection it should be explained that the increase in compensation shown in these tables is merely a computation of the difference between the amounts due under two sets of wage schedules for the service performed in a given period in 1917. No account is taken of the actual service and compensation for the corresponding period in 1916. Consequently, where there has been a reduction in the hours of labor per man per day, these percentages may indicate neither the change in the total labor cost to the carrier nor the change in the total wages received by the individual employee.

Increases in Wages as Affecting Individual Employees

The average increase in compensation in each occupation is by no means applicable to each individual in that occupation. Many employees received no increase whatever, while others received remarkably large increases.

Out of a total of 69,202 employees in 13 occupations on 64 roads included in a special study on this point, it was found that 12.6 per cent received no increase in January as a result of the law, and 30.2 per cent received an increase of less than $10 per month, as appears from the following table:

Amount of Increase per Month.	Number of persons receiving specified increases.	Per cent of total.
No increase	8,729	12.6
Under $10	20,931	30.2
$10 and under $20	15,688	22.7
$20 and under $30	16,163	23.4
$30 and under $40	6,578	9.5
$40 and under $50	975	1.4
$50 and over	138	0.2
Total	69,202	100.0

Overtime Payments and Additional Allowances

In the statistics requested of the carriers, a distinction is drawn between overtime compensation and the amount paid for "straight" mileage or "straight" time. In road service, the straight mileage is all mileage paid for at the mileage rate, and in yard service, or in other purely time service, straight time means the minimum hours which constitute a day. Overtime is the time paid for in addition to the straight time or mileage payments, but not including the allowances under special rules, which are paid in addition to the compensation for the mileage or time of the entire service.

The eight-hour standard which is being observed in road service is the so-called speed basis of 12.5 miles per hour. This simply means that overtime is considered as beginning after the expiration of the number of hours indicated by the quotient obtained by dividing the number of miles run by 12.5. For a run of 100 miles, this means that overtime begins after 8 hours have elapsed. Runs under 100 miles are considered 100 miles in length for purposes of compensation. For runs longer than 100 miles, overtime does not necessarily begin after the lapse of 8 hours. On a run of 125 miles, for example, overtime will begin at the expiration of 10 hours, 10 being the quotient of 125 divided by 12.5.

This arrangement may seem to be a violation of the statute, which says nothing about mileage and which makes 8 hours the measure of a day's work. But if the negotiations and discussions preceding the enactment of the statute be considered, the 12.5 miles per hour basis is not an unreasonable interpretation of its meaning. The Supreme Court of the United States has referred to the demand of the employees as being for a "permanent agreement as to wages by which the period should be shortened in which the fixed mileage task previously existing should be performed" * * * . The court also said that the statute "permanently applied an eight-hour standard for work and wages which existed and had been in practice on about 15 per cent of the railroads."

The effect of the law as applied is normally to leave the compensation for straight mileage or straight time unchanged. The same payment is now made for a minimum day of 8 hours as was formerly made for a minimum day of 10 hours. The mileage rate remains unchanged, while the rate per hour is increased. The increase in pay which the observance of the law brings to the employees is chiefly in the form of payment for more hours of overtime at an increased rate per hour.

The following two cases will serve to illustrate these distinctions further, and will also show what extreme results are possible under the law as interpreted. In the first case a passenger conductor on the Southern Railway received an increase of $124.70 per month, or 88.7 per cent of his former pay.

The details of his service and pay are as follows:

He ran 126 miles in short turn-around passenger-service each day for 31 days, or a total of 3,906 miles. His elapsed time, counted continuously from the beginning to the end of the day's work, averaged 16 hours and 35 minutes a day, but his actual time averaged 6 hours and 8 minutes daily. Under schedules in effect in 1916, his mileage paid for as straight mileage was 155 per day, which was the minimum mileage in that service constituting a day according to the Southern Railway schedules, at a rate of 2.9 cents per mile, making $4.50 per day, or $139.50 for 31 days. On one day he received 2 hours' initial terminal allowance at 58 cents per hour, or $1.16, or a total pay of $140.66.

Under the eight-hour day settlement, overtime in short turn-around and suburban passenger service is allowed not merely when there is more than 8 hours of continuous service within any 10 hours, but overtime is also allowed for all time in excess of 10 hours, taking the entire spread of the day's work as a whole. In this case the excess over 10 hours is 6 hours and 35 minutes, which is counted as 7 hours. Accordingly, this conductor received the former day's pay of $4.50 per day for 31 days, or $139.50, and in addition 7 hours overtime each day at 58 cents per hour, or $125.86, making a total payment of $265.36, being an increase of $124.70, or 88.7 per cent.

On the same railroad a case was found where the pay of a passenger conductor was less according to the agreements under the eight-hour law than under the schedules in effect in 1916. He made 31 round trips in the month of January, 152 miles per round trip, so arranged that the actual as well as the elapsed time was usually eight hours per day. This, with the overtime and extra mileage on certain days, made his pay on the old basis $149.73. On two of the days, the elapsed time was 8 hours and 25 minutes and 8 hours and 24 minutes, respectively. On the old basis, overtime began

after 7 hours and 36 minutes (152÷20), making the overtime over one-half hour (8 hours 25 minutes—7 hours 36 minutes), which was counted as 1 hour. On the new basis the overtime began at 8 hours, and was thus less than one-half hour, which was not counted. Two such instances in the month at 58 cents per hour, made the total pay $1.16 less under the new basis.

For 29,608 employees on the Pennsylvania Railroad in January the "straight" payments, for miles, hours, or trips, aggregated $2,624,078 under the 1916 schedules, and $2,622,267 under the eight-hour law, or substantially the same. The increase in compensation appears in the overtime payment, being for this road $321,420 under 1916 schedules and $857,661 under the eight-hour law, an increase of $536,241, or 166.8 per cent. The allowances under special rules amounted to $40,119 under the 1916 schedules and $45,117 under the present standard, being in both cases less than 2 per cent of the total compensation.

While the allowances under special rules are relatively unimportant in the aggregate, they do affect a large proportion of the men. The count of 69,202 individual cases to which reference has been made above, shows that 29,321, or 42.4 per cent, had received allowances under special rules. Overtime was made by 59,849, or 86.5 per cent of the individuals.

PER CENT WHICH OVERTIME IS OF TOTAL COMPENSATION UNDER EIGHT-HOUR BASIS: MONTH OF JANUARY, 1917.

Service.	Cleveland, Cincinnati, Chicago & St. Louis.	Norfolk & Western.	Mobile & Ohio.	Atchison, Topeka & Santa Fe (eastern lines).	Chicago, St. Paul, Minneapolis & Omaha.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Passenger:					
Through	1.8	5.4	0.5	0.9	3.7
Short turn-around	25.6	32.2	6.6	3.5	11.4
Freight:					
Fast	14.2	8.0	2.9	4.4	12.7
Slow	28.0	17.4	4.6	16.1	23.9
Local	30.9	27.8	11.4	31.3	32.6
Mine run	40.2	33.4	.....	37.4	.....
Helper	29.3	29.1	.....	17.8	27.3
Mixed	30.8	28.8	23.6	25.1	21.4
Wreck	41.1	33.9	46.6	21.9	14.0
Work and construction	39.3	33.4	29.7	33.4	19.7
Breaking in engines	36.3	.....	4.4	6.6	7.2
Attending court	.....	5.9	.....	0.8	17.1
Yard service	29.5	25.5	27.0	28.1	30.0
All services	24.1	20.8	11.5	17.7	23.4

There is a wide variation in the relative importance of overtime to total pay in the various subclasses of service, as is shown in the above illustrative table.

Typical Wages by Occupations in Relation to Service Performed

In addition to the report of the aggregate compensation under the old and new basis of pay, carriers were asked to give the names of the individuals to whom this compensation was paid, so far as they were employed in any one class of service during the month, and to show what was the service rendered by each individual as expressed in days, runs, miles and hours. This report concerning individuals was intended to serve partly as a check upon the accuracy of the general report, and partly as a basis for a study of the range of pay and hours in each occupation.

This study has been made for only 69,202 employees, as the tabulation had to be confined to those reports which were received promptly. For each of these individuals a card was punched in the office of the commission showing his compensation for the month of January, 1917, under the eight-hour law settlement and the number of days, miles and hours of service for the month, as well as other data. The cards were then classified and the items counted with the cooperation of the Bureau of the Census.

In the following tables certain results are shown for two occupations. Similar information for additional occupations is given in an appendix. Attention is first directed to the number of persons receiving specified amounts of wages per month.

NUMBER OF PERSONS RECEIVING SPECIFIED WAGES FOR THE MONTH OF JANUARY, 1917.

[Covers 26 eastern, 17 southern, and 21 western roads, in whole or in part.]

Wages.	Road freight engineers.						Road freight brakemen.					
	Eastern.		Southern.		Western.		Eastern.		Southern.		Western.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Under $10	22	0.96	23	1.67	82	3.52	216	3.74	164	5.65	405	6.30
$10 to $19	33	1.44	26	1.88	98	4.21	169	2.92	120	4.14	355	5.52
$20 to $29	18	.79	23	1.67	68	2.92	156	2.70	102	3.51	242	3.77
$30 to $39	26	1.14	21	1.52	50	2.15	166	2.87	119	4.10	227	3.53
$40 to $49	25	1.09	24	1.74	39	1.67	140	2.42	162	5.58	221	3.44
$50 to $59	22	.96	13	.94	28	1.20	207	3.58	221	7.62	286	4.45
$60 to $69	31	1.36	10	.73	32	1.37	270	4.67	208	7.17	354	5.51
$70 to $79	34	1.49	22	1.59	41	1.76	375	6.49	281	9.68	456	7.09
$80 to $89	40	1.75	39	2.84	40	1.72	556	9.62	306	10.54	614	9.55
$90 to $99	30	1.31	23	1.67	44	1.89	800	13.84	385	13.27	788	12.26
$100 to $109	50	2.19	41	2.97	55	2.36	908	15.71	390	13.44	835	12.99
$110 to $119	65	2.84	49	3.55	64	2.75	801	13.86	257	8.86	662	10.30
$120 to $129	86	3.76	46	3.33	73	3.13	567	9.80	138	4.76	412	6.41
$130 to $139	109	4.77	69	5.00	88	3.78	294	5.08	39	1.34	284	4.42
$140 to $149	146	6.39	89	6.45	106	4.55	118	2.04	8	.28	146	2.27
$150 to $159	154	6.74	90	6.52	123	5.28	32	.55	1	.03	72	1.12
$160 to $169	203	8.88	91	6.59	142	6.09	3	.05	.....	.....	31	.48
$170 to $179	206	9.01	107	7.75	163	7.00	1	.02	1	.03	15	.23
$180 to $189	246	10.76	103	7.46	155	6.65	1	.02	.....	.....	12	.19
$190 to $199	229	10.02	111	8.04	168	7.21	1	.02	.....	.....	8	.12
$200 to $209	198	8.66	88	6.38	158	6.78	.....	.....	.....	.....	2	.03
$210 to $219	135	5.90	68	4.93	150	6.44	.....	.....	.....	.....	1	.02
$220 to $229	58	2.54	67	4.86	112	4.81	.....	.....	.....	.....	.....	.....
$230 to $239	54	2.36	46	3.33	92	3.94	.....	.....	.....	.....	.....	.....
$240 to $249	42	1.84	32	2.32	56	2.40	.....	.....	.....	.....	.....	.....
$250 to $259	12	.53	20	1.45	34	1.46	.....	.....	.....	.....	.....	.....
$260 to $269	8	.35	14	1.01	30	1.29	.....	.....	.....	.....	.....	.....
$270 to $279	1	.04	9	.65	14	.60	.....	.....	.....	.....	.....	.....
$280 to $289	3	.13	9	.65	12	.51	.....	.....	.....	.....	.....	.....
$290 to $299	.....	.....	5	.36	7	.30	.....	.....	.....	.....	.....	.....
$300 and over	.....	.....	2	.15	6	.26	.....	.....	.....	.....	.....	.....
Total	2,286	100	1,380	100	2,330	100	5,781	100	2,902	100	6,428	100

The advantage of such a statement over that of a simple average is apparent. The typical earning of an eastern freight engineer, for example, was around $180 a month, and that of the eastern freight brakemen $100 a month, but there were many who received more and many who received less. It is not enough, however, to show how many persons received the specified earnings. It is desirable to know also the amount of service rendered in each of these classes. The tables in Appendix III will show by occupations an analysis of the days, miles and hours for each of the wage classes shown in the preceding table. It may be noted here that the very low earnings indicate that work was performed for only a fraction of the month and the high earnings imply large mileage or long hours.

Average Hours of Service

The following table shows the average hours per run, in the case of road service, and the average hours per day, in the case of yard service, for engineers on representative roads, as reported for the months of January, March, and May, 1917. These averages are on the basis of actual time for each of the subclasses of service except short turn-around and suburban passenger service, for which both elapsed time and actual time are shown.

It will be observed that the hours are shortest in through passenger service. This fact should be considered in connection with the number of miles run in this service. Data concerning the miles run by employees in various occupations and services will be found in Appendix II and Appendix III to this report. The foregoing table shows further that on the eastern roads in slow-freight service the actual time during which engineers are on duty is from 12 to 13 hours per run. In the southern and western districts, the corresponding figures are considerably smaller. In local freight

service, men work from 11 to 12 hours per run in all districts.

In road service the average hours shown in the table are nearly the same from month to month. In yard service the effect of the introduction of eight-hour shifts on certain roads in the month of May is apparent.

COMPARATIVE STATEMENT OF ACTUAL TIME ON DUTY PER RUN OR PER DAY, AS INDICATED, FOR ENGINEERS IN VARIOUS SERVICES ON SELECTED ROADS: MONTHS OF JANUARY, MARCH AND MAY, 1917.

Class of service.	Month, 1917.	Eastern district.				Southern district.		Western district.			
		Pennsylvania R. R. Co.	Cleveland, Cincinnati, Chicago & St. Louis Ry. Co.	Central R. R. Co. of New Jersey.	Delaware & Hudson Co.	Louisville & Nashville R. R. Co.	Mobile & Ohio R. R. Co.	Atchison, Topeka & Santa Fe Ry. Co. (eastern lines).	Chicago, Rock Island & Pacific Ry. Co.	Missouri, Kansas & Texas Lines.	Chicago & North Western Ry. Co.
Hours per run: Passenger service—		*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*	*Hrs.*
Through	Jan.	6.0	6.5	10.4	7.4	5.7	5.5	7.1	6.2	6.4	7.4
	Mar.	5.9	6.0	10.2	8.1	5.8	5.4	7.5	5.9	7.2	6.8
	May	5.8	5.9	10.2	8.3	5.9	6.1	6.7	5.7	7.1	6.5
Short, turn-around and suburban.	Jan.— Actual.	8.6	7.8	11.9	8.9	5.2	a10.8	7.7	6.9	7.2	7.3
	Elapsed	10.9	10.4	11.9	11.1	7.1	a10.8	10.0	8.4	10.3	7.5
	Mar.— Actual.	8.8	8.2	11.9	9.5	7.9	a10.7	8.0	11.3	5.9	7.7
	Elapsed	10.9	13.1	11.9	11.6	10.0	a12.4	11.3	15.7	8.9	10.4
	May— Actual.	8.6	7.6	11.7	9.3	7.8	a10.3	5.9	6.8	6.9	6.8
	Elapsed	10.8	11.1	11.7	11.2	9.9	a10.3	6.4	9.3	10.0	8.7
Freight service—											
Fast	Jan.	10.6	9.1	10.0	11.6	10.2	8.3	8.5	9.6	(b)	9.1
	Mar.	10.8	10.4	10.3	11.1	10.6	7.8	8.4	9.1	(b)	8.1
	May	10.3	10.3	10.1	11.8	10.0	8.2	8.2	9.4	(b)	8.6
Slow	Jan.	12.5	13.0	13.0	13.0	9.5	10.0	10.3	10.5	10.2	10.2
	Mar.	12.1	12.4	13.0	12.5	9.9	9.5	10.2	10.4	9.7	10.0
	May	11.7	12.5	13.0	13.0	9.4	9.2	10.0	9.9	10.1	10.1
Local	Jan.	11.7	12.6	12.6	12.1	11.2	11.4	12.0	11.6	12.2	11.7
	Mar.	12.0	11.6	12.6	12.3	11.6	11.1	12.2	11.9	11.9	11.1
	May	11.2	11.9	12.0	11.9	11.1	10.1	11.9	11.2	11.2	11.6
Hours per day:											
Yard service	Jan.	11.7	11.5	12.1	11.4	10.7	10.9	10.9	11.0	10.7	11.6
	Mar.	11.6	10.9	12.0	10.5	10.8	10.7	10.7	11.8	10.5	11.2
	May	9.1	10.0	9.0	8.6	10.6	8.0	9.4	8.4	8.8	11.0

a Represents hours per day, runs being incompletely reported.
b No service reported.

The statistics concerning the average hours on duty per run have been supplemented by a study of the total hours of service of individual employees for the month of January. The reports for 2,286 freight engineers in both slow and fast freight services, in the eastern district, show that 1,040, or 45.5 per cent, were on duty for periods aggregating less than 260 hours, the equivalent of 10 hours per day for 26 days, and 1,246, or 54.5 per cent, were on duty 260 hours or longer during the month. Those working 340 hours or longer, the equivalent of 11 hours a day for 31 days, were 233 in number, or 10.2 per cent of the total number considered. In the southern and western districts, the percentages corresponding to the one last given are respectively 4.7 per cent and 6.7 per cent.

The Speed and Delays of Freight Trains

The blank forms drawn up in conference with representatives of the brotherhoods and of the railways included one dealing with train operation from the standpoint of speed, tonnage and delays. This form provided for a statement of all freight trains in the two weeks' period ending March 17, 1917, classified as fast freight or slow freight, on certain selected roads agreed upon as representative. Such data as the following were requested to be shown separately for each train: Miles run by the train, the loaded and empty car mileage, the gross ton mileage, the delay at initial and final terminals, the delays en route, the time actually running, the miles assisted by helper and pusher engines, as well as the wages paid the crew on both the old and new basis. This last requirement delayed the filling out of this form because of the uncertainty of what would be the method of adjustment under the new law. Returns were received in time to be utilized from 23 companies in full or in part. The general purpose kept in mind in summarizing this information was to throw light upon the contention made by the brotherhoods that the increasing size of freight trains has been the direct cause of lengthening the hours per run. The railroads have replied that the cause of slow average train movement is the congestion of traffic rather than the size of the train. The statistical showing will not demonstrate that either side is wholly wrong. Theoretically, a heavy train can within certain limits be made to run as fast as a lighter one if sufficiently increased power is used; but taking the situation as we find it, with the assignment of locomotives actually made by the roads, it is true that the statistics indicate a somewhat slower running time for the heavier trains. There is no clear statistical showing as to the relation between the size of train and the amount of delay per train, but probably this is not to be expected, since an accident to one train may cause delay to a number of others of a different class. There is this further difficulty, that heavy freight trains and density of traffic usually go together, so that it is difficult to distinguish the one cause from the other, and the picture is also blurred by variations in grades, weather conditions, and character of traffic, and the inadequacy of power and other facilities.

A very general survey of the results is shown in the following table:

ANALYSIS OF SPEED AND DELAYS OF TRAINS IN SLOW FREIGHT SERVICE ON REPRESENTATIVE ROADS: TWO WEEKS ENDING MAR. 17, 1917.

Road.	Number of slow freight trains on divisions reported.	Per cent having a speed, including delays, faster than 12½ miles per hour.	Per cent having 30 or more loaded cars.	Per cent having less than 4 hours' delay.	Per cent having speed of more than 15 miles per hour actually running.	Transportation service train miles per mile of main track.[1]
	a	b	c	d	e	f
Atchison, Topeka & Santa Fe (coast lines)[2]	1,330	47.4	42.5	56.6	97.2	.....
El Paso & Southwestern	323	43.0	10.5	67.5	87.9	3,200
Atlantic Coast Line	1,237	36.2	35.1	33.7	93.7	3,198
Atchison, Topeka & Santa Fe (western lines)	1,018	28.3	49.3	48.4	75.1	4,122
Illinois Central	2,704	26.1	47.8	49.2	80.6	5,211
Atchison, Topeka & Santa Fe (eastern lines)	698	25.2	30.1	43.6	87.7	4,122
Union Pacific	1,906	25.0	45.3	51.1	69.4	4,747
Chicago, Rock Island & Pacific	2,516	21.6	27.1	55.1	75.3	4,152
Southern	2,900	20.3	40.3	30.8	79.4	3,997
Norfolk & Western	2,100	16.2	59.6	38.3	73.3	6,315
Great Northern	2,134	10.4	67.4	24.4	75.2	2,857
Chicago, Milwaukee & St. Paul[3]	149	11.4	85.2	87.3	48.9	.....
Toledo & Ohio Central	434	9.9	44.9	24.2	46.5	5,017
Cleveland, Cincinnati, Chicago & St. Louis	1,290	9.5	50.8	15.0	77.9	5,763
New York Central[4]	2,250	7.7	57.8	14.7	59.6	6,605
Pennsylvania Co.[5]	4,786	7.3	44.9	17.5	56.1	7,957
Erie[6]	1,253	4.5	60.3	23.4	36.3	6,850
New York, New Haven & Hartford[7]	133	4.5	21.1	28.6	88.0	7,237
Boston & Maine	1,579	4.1	26.5	25.6	59.9	6,709
Baltimore & Ohio[8]	3,104	2.4	54.3	11.1	57.0	6,186
Pennsylvania R. R.[9]	2,222	2.4	54.3	21.1	46.2	8,908
Bessemer & Lake Erie	280	2.1	60.6	41.8	37.4	7,200
Chicago, Indianapolis & Louisville	257	1.2	55.6	13.3	66.1	5,100
Philadelphia & Reading	2,065	0.5	45.0	24.4	26.9	9,332
Chesapeake & Ohio[10]	223	.....	60.1	28.2	20.6	5,118

[1] Includes both freight and passenger. Column f is calculated from the annual reports of operating carriers to the Interstate Commerce Commission for the year ending June 30, 1916.
[2] Includes 8 divisions.
[3] The Rocky Mountain division only.
[4] 7 divisions.
[5] 17 divisions, including part of the Pittsburgh, Cincinnati, Chicago & St. Louis Ry.
[6] 7 divisions.
[7] Old Colony division only.
[8] 12 divisions.
[9] 10 divisions.
[10] Huntington and Big Sandy divisions.

It will be observed that the percentages of the trains having a speed, including delays, of 12½ miles per hour ranges from 47 down to 0. Generally speaking, the roads

having heavy train loads and many trains per mile of main track are near the bottom of the list, and those of less density and lighter loads near the top. Whether the variations from the rule support one side or the other of the controversy above mentioned is a question that can not be decided except upon a study far more comprehensive than it has been possible for us to make. Incidentally, it may be noted that the percentages for the Baltimore & Ohio and Pennsylvania Railroad shown in columns (b) and (c) are the same. This is a curious coincidence and not an error.

For a smaller number of trains a study was made of those having fewer than 50 cars as compared with those having 50 cars or more per train. It was necessary to take the number of cars as a basis for classification rather than the gross weight, as not all roads could give data as to gross ton-miles. The general result was as follows:

COMPARISON OF THE SPEED AND DELAYS OF LONG AND SHORT TRAINS IN SLOW FREIGHT SERVICE ON REPRESENTATIVE DIVISIONS FOR THE TWO WEEKS ENDED MAR. 17, 1917.

Item.	Trains having fewer than 50 cars per train.	Trains having 50 or more cars per train.
Number of trains included in this table	11,050	4,467
Average number of cars per train:		
Loaded	24.29	35.54
Empty	8.30	28.03
Total	32.59	63.57
Average number of miles run per train	106.75	103.78
Average delay per train ..... hours and minutes	5 32	5 41
Average actual running time ..... miles per hour	15.91	13.99
Average speed including delays ..... do	8.71	7.92

The selection of the operating divisions in these tables was determined by the order in which reports were received from carriers and the degree of completeness of the work of compilation, as many as possible being included.

It should be noted that trains having more than 50 cars are not always heavier than those having fewer than 50 cars, since the former may include relatively more empties. As a general rule, however, the long trains are the heavier. On roads reporting gross ton-miles it appeared that for 6,520 trains having fewer than 50 cars and 2,552 trains having more than 50 cars the average gross weight per train was 936 tons for the short trains and 1,289 tons for the long trains.

The difference in speed between 8.71 and 7.92 miles per hour for a 100-mile run means a difference of 1 hour and 9 minutes per run in favor of the shorter train. But this cannot be set down as a universal rule. In the following table the results are given for each of the roads represented in the total figures above mentioned. In a number of cases, no appreciable difference is shown.

Certain theoretical aspects of train speed are presented in the special report by C. P. Howard.

Railway Wage Schedules and Agreements

The eight-hour day act has effected a considerable change in the wage agreements under which men in train and engine service work. In simple language, it provides that eight hours shall, in contracts for labor and service, be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation for services of employees engaged in the operation of trains; but the task of revising the very numerous and complex schedules or agreements with the different classes of employees so as to comply with the law has involved a difficulty like that which would be met with in changing the size of one wheel in a clock and then making the clock keep time. A presentation of the development and nature of these agreements or schedules governing wages and hours, together with a record of the changes resulting from the eight-hour law, is properly a part of this report. A detailed examination of this subject was made for the Commission by Prof. William Z. Ripley, of Harvard University.

DELAYS AND RUNNING TIME OF TRAINS IN SLOW-FREIGHT SERVICE BY ROADS.

Name of road.	Number of trains.		Delays per train.		Actual running time.	
	Short trains.a	Long trains.b	Short trains.	Long trains.	Short trains.	Long trains.
			H. m.	*H. m.*	*M.p.h.*	*M.p.h.*
Atchison, Topeka & Santa Fe (11 divisions)	1,112	600	5 06	4 38	17.66	17.88
Chicago, Rock Island & Pacific (12 divisions)	1,436	248	4 08	5 05	16.37	15.79
Great Northern (12 divisions)	1,442	658	6 11	5 03	16.93	15.28
Union Pacific (2 divisions)	563	191	4 46	4 40	18.75	18.40
Atlantic Coast (3 divisions)	1,092	227	5 04	5 51	19.42	20.88
Southern Railway (3 divisions)	445	33	5 50	4 41	17.41	17.89
Boston & Maine (2 divisions)	371	13	5 38	4 29	15.64	12.49
New York Central (3 divisions)	237	561	6 32	6 28	16.20	12.64
Pittsburgh, Cincinnati, Chicago & St. Louis (3 divisions)	702	167	6 31	5 48	16.60	14.09
Philadelphia & Reading (4 divisions)	1,577	799	5 52	c5 52	11.96	9.93
Pennsylvania Co. (2 divisions)	551	148	6 32	7 17	12.26	12.49
Baltimore & Ohio (4 divisions)	437	229	7 11	10 14	15.62	14.56
Bessemer & Lake Erie	260	98	4 21	5 13	14.19	13.57
Erie (4 divisions)	344	244	6 32	5 37	13.24	12.22
Kanawha & Michigan (2 divisions)	117	122	2 35	1 26	13.29	13.59
Toledo & Ohio Central (2 divisions)	364	129	5 09	6 32	15.06	10.88
Total	11,050	4,467	5 32	5 41	15.91	13.99

a Fewer than 50 cars.
b Fifty cars or more.
c The fact that this figure is the same as the corresponding one in the preceding column is a coincidence and not an error.

In describing the schedules concerning the work of train operatives, this report by Prof. Ripley necessarily deals with the same subject matter which underlies the report of Dr. Clark on employment conditions, but the point of view is distinct. The one is a study of the development of the employment contract, while the other is a record of field observations.

As a result of his investigations, Prof. Ripley is led to make certain recommendations regarding the organization of a permanent wage board. These should not be taken as recommendations of this commission, as they lie beyond the scope of its work.

Employment Conditions in Road and Yard Service

The commission is directed among other things to observe the facts and conditions affecting the relations between carriers and their employees. As previously indicated, we have not considered it our duty to study the adequacy or inadequacy of the wages in relation to the cost of living. Consideration was given to undertaking a study of occupational fatigue, it being frequently asserted that a reduction of hours would reduce fatigue and prevent accidents. But no practical plan of procedure that could be carried out within a few months at small cost was suggested. It is possible that an amplification of the monthly accident reports required by the Interstate Commerce Commission, so as to show the number of hours on duty and hours of rest preceding accidents for which individual employees are responsible, might in the course of years yield definite results. The whole matter of accidents to train employees was set aside in order not to duplicate the work of other departments of the government. The statistics of the Interstate Commerce Commission amply demonstrate the hazardous character of the work of train operation.

The task of investigating and writing a description of the working conditions in train and yard service was assigned to Dr. Victor S. Clark. Dr. Clark traveled extensively in the summer of 1917, interviewing the men who work in train and yard service and the officials of the road who come in contact with the men. His special report will be found in Appendix VII. He describes the entrance requirements,

the promotion and discipline, seniority rights, and the regularity of employment in the occupations affected by the eight-hour law. Salient facts with respect to the hours of labor and of the living conditions of train operatives at home and on the road are presented. Dr. Clark's report may be characterized as a careful summary of the views of employees and officials whom he interviewed in the course of his investigations.

Practicability of an Actual Eight-Hour Day in Train Service

Although the distinction is elsewhere noted in this report, it is well to emphasize the fact that while the law requires eight hours to be the measure or standard of a day's work for the purpose of reckoning the compensation for services of train employees, it does not limit the actual working time to eight hours. As explained above, overtime does not begin at the expiration of eight hours if the run is more than 100 miles and is made at the rate of 12½ miles per hour or better. For runs of 100 miles, the actual eight-hour day as ordinarily understood is the same as the speed basis of 12½ miles per hour. Very generally in the freight service this average speed is not attained. The engine and train crews as shown in other sections of this report average considerably more than eight hours per day, or less than 12½ miles per hour. In the discussion preceding the enactment of the law it was contended for the railroads that they could not, to any large extent, eliminate this overtime by increasing the average speed of trains to the 12½ mile per hour basis without exorbitant cost.

In response to the question whether the railroads would run their trains any faster if they had to pay time and a half for overtime Elisha Lee, speaking for the roads, said:

We formed a committee subordinate to the national conference committee, or what we called the "Studies committee." I think there are about 12 or 15 men in the East and 3 or 4 from the West and 3 or 4 from the South—the three territories—to study the proposition and see in what manner the operation could be changed to meet this burden if it was imposed upon us.

The witness further stated that the conclusion they all came to after making these studies of different portions of the road was that the most economical thing to do was to operate in the same way as they are operating to-day and pay for the overtime. S. Doc. 549, 64th Cong., 1st sess., p. 89.

On the other hand, it was contended for the brotherhoods that "if you touch the pocketbooks of these operators, these operating officers, they will so regulate their business that the men will not make the long hours that we are making now." Statement of W. G. Lee, id., p. 68.

As a result of the law, even with pro rata overtime, there have been numerous instances of changes in operation of trains in road service shortening the time of runs, as shown in a previous section; but generally speaking, no marked change in operation in road service is observable. As elsewhere explained this is not true of yard service, in which an actual eight-hour day has been generally introduced. To what extent it would be practicable ultimately to limit the hours of road train employees to eight per day it is impossible to say.

The commission was urged by representatives of both the brotherhoods and of the railroads to make some study of this matter. It was found that an exhaustive field study of representative operating divisions would be an undertaking far beyond our time and appropriation. It was thought, however, that some light could be thrown on the question at issue by a critical examination of available material. Charles P. Howard, an experienced engineer in the Bureau of Valuation of the Interstate Commerce Commission, was employed to make this examination and to write a special report, which will be found in full in Appendix VIII. The sketch there given of the principles governing relation of speed and tonnage will explain some of the technical considerations affecting the problem.

The railroad representatives placed at Mr. Howard's disposal the operating studies referred to above. In his critical review of these studies he gives consideration to the various possible plans of procedure open to an operating official confronted with the requirement of time and a half for overtime as follows:

1. Pay the time and a half with present methods of operation.
2. Cut the tonnage and increase the speed.
2A. Cut the tonnage and increase both the speed and track facilities.
3. Increase the trainload by means of heavier engines without increasing the speed.
4. Increase the speed by heavier engines without increasing the load.
5. Increase the speed by expenditures for additional facilities.
6. Shorten the time on duty by relaying freight crews, the engines going through.
7. Plan No. 7 applies to yard, hostlers, and local freight service and contemplates rearrangement of shifts or runs.

All of these plans were not studied on every division. Generally speaking, in spite of many errors and inconsistencies found in the studies, plan No. 1 is shown to be the cheapest in road freight service. Mr. Howard concludes that the roads cannot speed up all of their freight trains to 12½ miles per hour, including delays, by any universal method. But by close attention to the problem of reducing delays and with sufficient incentive, conditions as to hours of work in road train service can be improved in varying degree and by varying methods according to local conditions.

The commission expresses its appreciation of the efficient help it has received from its secretary, Dr. M. O. Lorenz.

English Railwaymen Visit the Front.—The National Union of Railwaymen has accepted the government's invitation to send a delegation of railwaymen to the Western front. The delegation will comprise 350 members, including the executive, elected delegates to the annual general meeting, general officers, and four representatives from each of the 60 union groups. Each representative will travel at his personal risk. The executive committee of the Society of Locomotive Engineers and Firemen has declined the government's invitation that 35 of the members go to the front. This is the first refusal from the various labor bodies, delegations of which have recently visited the battlefields. A resolution adopted by the committee says that owing to the long hours of duty in force and the absence of so many men from work it would be unfair to the others to accept the invitation.

Zone System for Spanish Freight.—The great increase in the cost of sea freight between Spanish ports has resulted in throwing upon the railroads an accumulation of freight that they are unable to cope with. In order to relieve the congestion, the coast of Spain has been divided into three zones, and a special tariff prescribed for maritime freight to different ports in each zone. Freight exceeding one-half metric ton in weight will not be accepted by the railroads from port to port, with the exception of animals, fowls, fresh fruit, and vegetables. Regulations are prescribed as to the kinds of freight to be transported by the coastwise trade in the various zones, taking into consideration the products of each zone and the shipping available. The coast zones are connected with inland zones and the merchandise of these zones may only be shipped from the ports at which the railroads of each particular zone terminates.—*Commerce Report.*

The Trans-Continental Railway of Australia*

Water Supply the First and Last Thought of the Builders of This 1,053-Mile Standard Gage Line

IN THE SPARING words of its engineer-in-chief: "The construction of the Port Augusta-Kalgoorlie Railway was a work of great magnitude and beset with unusual difficulties." The world has many transcontinental railroads. Some of them are longer than this first project of communications undertaken by the federal government of Australia. Many of them have involved greater engineering problems. The piercing of the Rockies; the traversing of the Andes; the penetration of the primeval forests of Central Africa alike have called for the daring and ingenuity of the surveyor and the engineer. But in none of them were there to be faced the same difficulties as those which had to be surmounted in throwing a single track from east to west across the heart of the Australian continent. The line was part of the federal

The Railways of Australia and the New Transcontinental

compact under which Western Australia entered the Australian Commonwealth. It was to connect the Eastern railway system, ending at Port Augusta, in South Australia, with the Western system, whose "furthest east" was Kalgoorlie, flanking the famed Golden Mile of Boulder City. It was to be a line of high standard; the federal government set its face against any perpetuation of the tragic system of "broken" gages by which the various state railways are divided into traffic-tight compartments. It decided to have neither the 3-ft. 6-in. narrow gage of Western Australia nor the 5-ft. 3-in. widest gage of Victoria, but to adhere to the 4 ft. 8½-in. world's standard, and to use its influence, and that of the Transcontinental, to convert the 3-ft. 6-in. trunks of Queensland and Western Australia, and the 5-ft. 3-in. of Victoria and South Australia, to the desired standard.

The Terrain

The whole distance to be covered was 1,053 miles, not a great distance in a continent larger than the United States. The terrain varied considerably. Starting from Port Augusta the line crosses the head of Spencer's Gulf at Yorkeys Crossing. It then contours the rising ground to the westward, running through sand rises and gypsum banks, until a sparsely-timbered plateau gives occupied pastoral country with fresh water in wells for 200 miles. There are copper outcrops in plenty. Gold has been, and is being, successfully mined on the range at Tarcoola, 262 miles west of Port Augusta. From Tarcoola westward, the country becomes gently undulating, somewhat sandy, developing at about 380 miles west into a region of parallel sand ridges, as many as five to a mile, covered with "black oak," "mulga" and "mallee scrub," which, although there is no surface water, gives to the eye sweeping views of tossing greenness, and nullifies the careless term of "desert." At 428 miles from Augusta the route debouches suddenly on to the famous "Nullarbor," an absolutely level and treeless plain—a plain as big as France, averaging 600 ft. above the sea-level. It is of limestone formation, covered with a good red soil, growing luxuriantly the salt-bush and blue-bush, most valuable food for stock. For 330 miles on the "Nullarbor" the line runs without a curve—the longest tangent in the world. There is no surface water, but extensive boring is producing fresh water in large quantities. The Western Australian border is reached at about 592 miles west in latitude 30 deg. 45 min. south. At 850 miles from Augusta the plain ceases as suddenly as it began, and lightly timbered country accompanies the line right into Kalgoorlie. The greatest elevation reached on the route is 1,354 ft. This is at a point 107 miles from Kalgoorlie, which itself stands at a height of 1,240 ft. above sea-level.

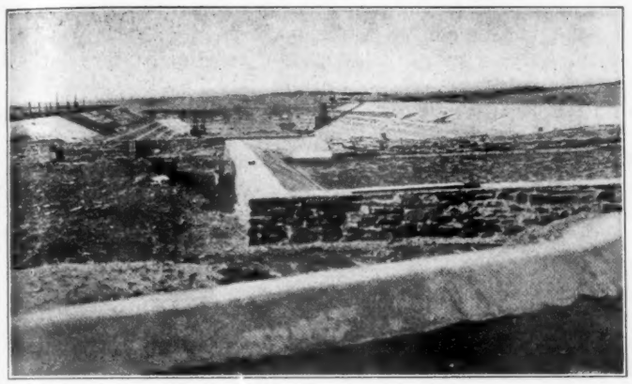
On the whole route there are no steep ranges to be tunneled. There are few defiles necessitating deviation. The grades are therefore simple. In the Eastern Division (*i. e.*, that portion of the line within South Australia) the ruling curve is 1 ft. in 88 ft., compensated for curvature, with a maximum curvature of 4 deg. 20 min. The ruling grade in the Western Division (in Western Australia) is 1 ft. in 80 ft., compensated for curvature. This grade occurs only in the first 105 miles, after which there is no steeper gradient than 1 ft. in 100 ft. The maximum curve of 4 deg. 20 min. occurs only twice, and that within the town area of Kalgoorlie. At 400 miles west from Port Augusta the dreaded Sandhill Country, with its persistent swelling ridges, slightly transverse to the line of route, necessitated heavy earth works and considerable banking, when access from one valley to another had to be negotiated.

Organization for Construction

Let it be admitted, therefore, that the proposition was not an excessive one from the point of view of the surveyor. But let it also be remembered that in the "inside" of the Australian continent "life" is spelt with more letters than in Europe. For life needs water, and of natural surface water there was none in the whole stretch of 1,050 miles. Given water on the route, and this description would have been written decades since: Water—and the soil, rich alike in minerals and fertility, would today be supporting a close population. But when construction commenced, at least 800 miles of the route was entirely uninhabited. Over the whole route there was no local population from which labor might be utilized, or food produced for man or beast. Organization was therefore necessary of a kind quite unusual in ordinary railroad enterprise. It was less like an engineering job than the organization of a campaign. The Commonwealth government built it as a direct government enterprise. What few contracts there were were subsidiary. Labor—practically all white—had to be brought hundreds, sometimes thousands of miles, and maintained per-

* From Engineering, London. This will supplement the article in the *Railway Age Gazette* of December 28, telling of the recent completion of the line.

manently on the line. Construction had to embrace not only a highly developed system of transportation of material, water, and other supplies; the government had to provide stores and personal necessities for the workmen and their families; boarding houses, huts and food ranches for the housing of employees; postal, telegraph and banking facilities; medical and field hospital units; libraries and other necessities which, in other countries and under ordinary circumstances, are the care of private enterprise or other intermediary.



Wirrappa Reservoir, South Australia

Water and Food Supply

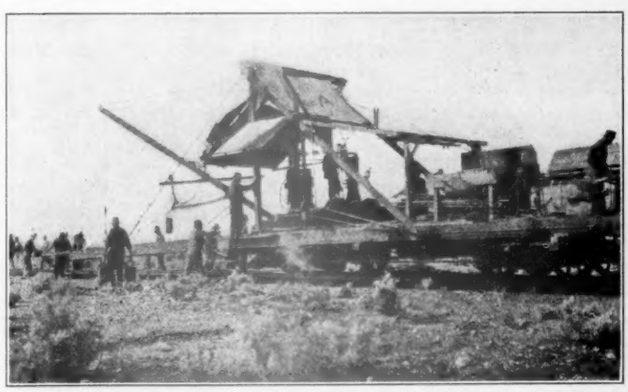
Water was the first and last thought of the engineers. Over the greater part of the route there are no watercourses of any size; an indication that the streams carrying off the rainfall are so little concentrated that opportunities of holding up volumes of water by the construction of dams was reduced to a minimum. The annual rainfall over the whole area does not average more than probably 7 in. There are occasionally intervals of years during which rainfalls are too scanty for collection. At Port Augusta an indifferent town supply existed at the outset. Another scheme had therefore to be added to the engineering programme. To the uninitiated, a more hopeless place in which to seek a water catchment never existed than the dry lands of Spencer Gulf. The surveyors and the well-borers of the overland line deserve well of their country. With their camel teams and petrol engines they have punched holes in the most arid proposition to be found in Australia. The camel is bred in thousands in South Australia, and was used on the line for everything—haulage, riding, water carrying; he was, in short, "General Utility." For the Eastern Division, at 26 miles from Port Augusta, they laid toll to the one possible supply. An intake weir of 278,000 gal. capacity was constructed at Depot Creek. Five catchment reservoirs of a total capacity of 30,000,000 gal. were constructed at intervals for 250 miles west from Port Augusta. Wirrappa with its massive concrete revetments, its asphalt-lined tanks of 5,000,000 gal. capacity, was one of the pioneers. In the Western Division the line possessed the advantage of the Mundaring pipe line supply at Kalgoorlie. The water had already made a journey of over 300 miles before it reached the Golden City. It had now to be carried by rail further east for the maintenance of the construction camps. The Western Division is off the artesian belt. In the quest for water, the boring parties went forward for hundreds of miles into the Nullarbor Plain. With the mirage and the Willy (*i.e.*, a fast-traveling spiral dust-whirl) for company, baked by the ever-present sun, chilled with the sweep of night winds across the waste, they wrestled with the living rock; dragged from its depths water which often reached the surface warm. The bores reached a maximum depth of 1,500 ft. The daily flow varied from 7,000 gal. to 70,000 gal. The engineers thus provided adequate water supplies, not merely for construction, but permanently for line operations. But an immense amount of haulage for construction trains was inevitable. During one year of work, engine mileage amounted to 795,105 miles; and vehicle mileage to 8,748,000.

Next to water supply came the problem of food. For with over 2,000 employees scattered over sections 300 miles in length, the question of maintenance was serious. Added to which the men were of a race accustomed for generations to live well. They absorbed food generously. The government opened provision and general stores for their needs. The stores had to be self-supporting. Bread and meat supplies were organized by the department on similar lines. The authorities did their utmost to prevent the sale of alcohol. In the Western Division particularly, huge "ranches" (*i.e.*, restaurants) were set up, run directly by government, moving always with the gangs, and furnishing them with splendid food at cost prices.

New Construction Methods

The construction work was commenced in july, 1912, by Henry Deane, Commonwealth government consulting engineer. In April, 1914, Colonel Norris Bell was appointed engineer-in-chief. He drove the last dog-spike in October of last year. The line was built from both ends. It is of the standard 4 ft. 8½-in. gage; 80-lb. rails were utilized. They are flatbottomed, as is the custom in Australia, dog-spiked directly to the ties. The preliminary supplies were imported from America and England; the latter half from the local steel mills of New South Wales. The ties were, of course, obtained in Australia. Two and a half million tons were utilized. Even engineers would have been immediately struck with their extreme length. For Australia "has timber to burn," and it was argued that the larger ties ensured a good road-bed, even before ballasting could be completed.

Again one had to note that the method of construction was not ordinary. The surveyors generally followed the bench-marks of the preliminary trial survey of 1908. In the areas of scrub and scattered timber, there had, of course, to be a certain amount of axework. In the main, however, the open plains and tablelands made for more expeditious methods. Mechanical methods were availed of to the utmost. On the heels of the surveyors came the petrol tractors, with disc ploughs which made light of stones, ripping up the light virgin soil of the overland. With scoops and horse and camel teams the road-bed was quickly formed. A "Castles" excavator was utilized for a time in the Eastern Division, completely rolling and forming the banks in one operation. Immediately afterward appeared the construction train, headed by a track layer, a "notion" from America. The



The American Track Layer at Work

track layer was to become the "tank" of the overland route. It was rather a labor-aider than a labor-saver. Its swinging derricks operated by steam power from the locomotive, waved like the antennae of a giant lobster over the prepared road-bed. From alternate flat-topped bogie wagons, ties and rails were delivered into trough conveyors hung to each side of the construction train, mechanically operated rollers passing them forward, to be gripped by the derricks, swung out in front to where a rushing gang of navvies slammed them down, to be hastily linked and dog-spiked into position on the earth cushion. It was arranged that the derricks on one side should be longer than the other. The ties were conveyed on the longer side, having to be delivered ahead of the rails. Every few minutes the train moved forward on the new-laid track; every few minutes the converging railheads in

A Wayside Station and Inspection Train

east and west moved closer together. Behind the track layers the line was pulled in, packed, and otherwise completed, by the fettling gangs and the *olla podrida* of a railroad camp. A temporary station was formed at each railhead, including a loop, and two "dead-ends."

Base Organizations

A fair rate of progress of a mile a day was the object of the engineers, though it can hardly be said to have been attained. Yet every day the railheads moved forward inexorably in obedience to the capabilities of communication in the rear. Every 20 days there was something like an exodus. For the hutments and workshops of a thousand employees, the camp trains of the engineering and surveying staffs, the hospital cars of the medical section, recreation rooms, churches, cooks, camels, the miscellaneous paraphernalia of the railhead, moved also onwards to the new front. And in the Nullarbor, they said, a man might go to sleep on the morning of such a trek, wake on the site of the new encampment, and never know, from his surroundings, that the location of his camp had been moved.

With railhead and construction camps totally dependent upon the line for daily existence, both Eastern and Western Divisions had necessarily to be progressively complete and self-contained. What bridging work had to be done—for the most part the negotiating of dry, though sometimes wide, dongas—could never be allowed to hold up through communication. At such places, by means of slight deviations, the rails were led down into the bed of these depressions. The concrete piers and bridge girders were constructed later, and the line subsequently pulled into permanent position. Nor could conventional methods be followed even at the great base depots at Port Augusta and Kalgoorlie, whence were distributed the hundreds of thousands of tons of rails and fishplates, and the millions of ties required for construction. For to Kalgoorlie the material was dragged over a line of 3-ft. 6-in. gage, so that sidings of combined gages had to be constructed to carry the alternative wagons; while at Port Augusta the material was received from ships' slings, after a long sea haulage up the narrowing waters of Spencer Gulf.

The government took every possible step to safeguard the health of the men engaged on the line. The utmost care was taken to ensure good food. Hospital cars with proper dispensary and operating accommodation were provided in both sections. Medical attention and hospital accommodation were provided by the government for all employees, who contributed a general sum of 6d. (12 cents) each per week. The total number of accidents on the whole work was well under 1,000, causing a total loss of life of about 20.

Rolling Stock and Equipment

It was the aim of the Commonwealth government to build a line capable of carrying traffic at high speeds. The line is of the best workmanship, and, so far as passenger accommodation is concerned, the engineers of the Commonwealth have been scouring the world for the latest ideas in traveling luxury.

Huge day-and-night coaches, of a size undreamed of in England, saddled with its legacies of tunnels and bridges of a past railway age, will leave no device unexplored that will minister to the enjoyment of passengers. The Australians are inveterate travelers. They do not mind being in the train for a week, but they demand comfort. Ice in the hot weather, heating in the winter, and baths whenever possible. It is safe to say that they will make their great "through" expresses *trains de luxe*. Most of the construction rolling-stock, practically all of the locomotives and coaches for the new line, will have been built by Australians in Australia.

Results Achieved

Such, briefly, is the history of a great undertaking. It has been accomplished at a cost of millions of national money, provided out of a consolidated revenue by the Australian taxpayer. It renders possible one of the longest railway runs in the world. From tropical Townsville, sheltered behind the Barrier Reef, the traveler may soon run by way of Brisbane, Sydney, Melbourne and Adelaide, to Perth, on the surf-beaten shores of the Indian Ocean—a run of 4,000 miles. He may do this in the running time of 150 hours. Every foot of the track is owned by the State. The line joins the Eastern system of 15,000 miles to its isolated daughter system of 3,000 miles in the west. It is a visible pledge of federation. It is the pioneer of many great similar projects which are aimed at the internal development of a continent. It provides for the military defence of the country on interior lines. The voyage from west to east of the continent has been halved in point of time. And the tenacity of Australian engineers has tamed the wilderness. Out in the former "unknown" settlements have already sprung up along the line. The optimism of their population is expressed in names like that of "Golden Ridge," but it is an optimism that has subdued deserts, and is making the Australian Nation.

THRIFT, THE INDISPENSABLE PREREQUISITE OF VICTORY.—It is the duty of every man, woman and child in the United States to produce more and consume less, and then to pass over to Uncle Sam through the purchase of Liberty bonds the savings which he has effected in this two-fold manner. The next sale of Liberty bonds can be of no value to the government unless those savings of goods and labor are now being made for which the money which the government borrows can be exchanged. In a war which is taxing the capacity of every nation engaged thrift becomes the indispensable prerequisite of victory.

Form to Be Taken By New Railroad Financing

Recommended That a Bondholders' Committee Be Established While Company Is Solvent

THE REPORT OF COMMITTEE on railroad securities of the Investment Bankers' Association was divided into three parts; the first part dealing with the causes of the decline in railroad credit was published in a recent issue of the *Railway Age Gazette*. The second part of the report is given below.

As many of the mortgages formerly available for railroad financing are virtually exhausted in usefulness, or actually closed, resort must be had to the issuance of new general refunding mortgages covering all of the property of the railroad, and so drawn as to provide means for financing requirements through the sale of bonds issued under these mortgages as long as the credit of the road warrants. One of the chief financial problems of the railroad companies and their bankers today is that of raising money through the sale of bonds issued under such mortgages. It is undoubtedly true that such bonds have not recently been popular with the investor. If any suggestion which we make should lead to the adoption of means by which these issues can be made more attractive, we feel that the financial position of the railroads will be immeasurably bettered.

We recommend that general refunding mortgages should provide that bonds issued thereunder be in series, in such form as may be determined by the board of directors, each series to have such special features in reference to date of maturity, rate of interest, place of payment, redemption, convertibility, sinking fund, registration and exchange as may be determined as necessary at the time of issue; that all series should be equally secured by the mortgage, and the rate of interest should be fixed at the time of issue of any series without any maximum limitation. There should be no fixed limit as to the amount of bonds which can be issued under a general refunding mortgage. The provision of the New York state savings bank law to the effect that the maturity of refunding bonds must extend beyond that of any bonds to be refunded appears to us unwise, and we believe steps should be taken to modify this provision to the end that failure to comply with it will not have the effect of eliminating the railroad bonds so issued as legal investments.

There is another provision of the New York state savings bank law that we think should also be repealed, namely: that which pertains to the limitation that the authorized amount of bonds to be issued under a refunding mortgage shall never exceed three times the outstanding stock. This provision in our opinion is unwise and if, as seems likely, stocks should in the future be issued without par value, it would lead to great confusion. We recommend that the only provision in the mortgage should be one similar to that in many public utility and industrial mortgages, providing that additional bonds may only be issued—other than for the refunding of underlying bonds, or the acquisition of securities—for a certain percentage of the cost of new construction, betterment, etc., and for a certain percentage of the cost of new equipment, but only provided that the net income for the preceding twelve months (after deducting taxes) exceeds one and a half (or two) times the total fixed charges, including rentals, hire of equipment and other prior charges and interest on the bonds to be issued.

The issuance of bonds for the acquisition of stocks or bonds to be deposited under the mortgage should be limited to a comparatively small proportion of the total bonds outstanding at any one time.

One of the weak features of railroad mortgages brought to light by recent experience, is that the bondholder had no redress until there is a default under the mortgage and the property goes into the hands of a receiver. We do not believe it is practicable to attempt to remedy this weakness by giving the trustee more authority. Too often, owing to the exigencies of the situation, the trustee has to bid competitively for the business without an opportunity to examine the indenture thoroughly before stating its fees, and the small payment it receives for its service does not warrant it in taking much responsibility.

To remedy this situation we submit two suggestions which we believe are worthy of careful consideration. We do not here present them in detail, as we desire to have an expression of opinion only on the principles contemplated by these suggestions.

A Bondholders' Protective Committee

The first suggestion is that provision be made for the election by the bondholders of a permanent bondholders' committee, composed of men who are not officers of the railroad: this committee to have power to call meetings of the bondholders for the consideration of their interests whenever it sees fit; to employ an expert who would at all times keep in touch with the property, and whenever necessary call the attention of the committee to any evils which he considers should be remedied. A provision should be placed in the mortgage providing for annual meetings of the bondholders, at which meetings they would have the right to make changes in the permanent committee through an election; to consent to something not provided for in the mortgage, or to waive default and to delegate powers to the committee as their representative, sufficient in scope to enable such committee to take any action that might in its judgment be calculated to preserve the interests of the bondholders.

The second suggestion is to split up the functions which the trust company is now supposed to perform, but in the course of which it generally avoids any action requiring the exercise of discretion and consequently fails to perform, into two sets of powers. The first set of powers would be the real functions of the trustee, namely, taking notice of defaults and enforcing the rights of bondholders, dealing with release of property and securities and substitution of securities, and calling the bondholders together in a meeting whenever consent by vote of a stipulated amount of the bonds is rendered necessary or desirable by reason of something out of the ordinary. The second set of powers would relate to the custody of securities and money and the certification of bonds. The first set of powers is the one which involves the exercise of discretion and a certain amount of interested supervision, and should be vested in individuals as trustees; the second set of powers involves no discretion, but simply strict adherence to the terms of the mortgage, and should be vested in a trust company as trustee, because the bondholder prefers a responsible financial institution as his representative in such matters.

In either case the permanent bondholders' committee or the individual trustees appointed to represent the bondholders should be men of recognized standing. They might be allowed to fill vacancies among their number, subject to the right of the bondholders to elect someone else at a meeting called for that purpose. Their compensation and ex-

penses, and those of the expert would be determined as part of the original bargain of the railroad.

Trustees Are Not a Protective Committee

The present unsatisfactory situation is due to the fact that the trust companies are now supposed to exercise supervisory and discretionary power, although they are not compensated sufficiently to warrant them in taking any risk. Individuals who really represent the bondholders would exercise the kind of supervision and discretion that the bondholder considers that he has a right to expect from those whose special function would be that of guarding the integrity of his security.

In the event of either of these suggestions being adopted, it would seem desirable that mortgages should provide the machinery for calling meetings of bondholders and for the authorization or ratification of acts which the trustees recommend, by a vote of a stipulated proportion of the bonds, which vote shall be binding upon the minority. Most of the existing mortgages create difficulties by reason of the existence of provisions in them which stipulate that the unanimous consent of the bondholders is required for any departure from their strict terms, yet all of us know of things which it would have been very desirable to do, both in the interests of the railroad company and of the bondholders, and also know of foreclosures and expenses of reorganizations which might have been avoided if there had been any machinery by which a given proportion of the bonds could bind the minority in consenting to something not provided for in the mortgage, or in waiving some default.

No Equipment Trust Certificates

The committee on railroad securities, in its report to the fifth annual convention recommended that all equipment purchased or already owned should be placed under the general refunding mortgage, and that the present method of issuing serial bonds, payable in one to ten years, secured by equipment alone, be discontinued as rapidly as practicable. We heartily agree in this recommendation. In the event of a receivership it is always well for the bondholder to own the equipment as well as the track or line of road, otherwise he is in the position of a workman without tools.

Where general refunding bonds are issued for the purchase of new equipment, we recommend that carefully drawn restrictions or safeguards be placed in the mortgage. In connection with rolling stock and floating equipment pledged under the mortgage and owned by the railroad company at the date of the creation of the mortgage, the mortgage itself should specifically enumerate the total number and capacity of the locomotives, passenger-train cars, freight-train cars, floating and other equipment, and the net book value of the same (after deducting accrued depreciation and outstanding equipment trust obligations, if any) and the aggregate capacity of every class of equipment should always be maintained. Bonds reserved under the mortgage for the construction or acquisition by the railroad company of new rolling stock or floating equipment for use upon or in connection with any of its lines of railroads at any time subject to indenture, should not be issued for more than 90 per cent of the cash cost of such equipment, and no bonds should be issued in respect of equipment acquired subject to or through any equipment trust or other lien. The face amount of all bonds issued for new equipment, or cash paid for the acquisition of new equipment, should be added to the net book value of the equipment specified, as mentioned above, in the granting clause of the mortgage for the purpose of fixing the value of the equipment to be maintained by the railroad company or replaced when destroyed The railroad company should be required, either annually or semi-annually, to furnish a report to the trustee showing the total number and capacity of each class of equipment, together with the net book value of all the equipment after deducting accrued depreciation, etc.

The previous committee on railroad securities recommended the issue under the general refunding mortgage of a special series of bonds to cover new equipment purchased, which series should be paid off serially in from one to twenty years. We have found strong objections to this issue on the part of the railroad managers, as they feel that such series would command a better price and would tend to make the sale of other series under the same mortgage difficult because of their longer maturity. Certain recent mortgages contain new provisions in regard to bonds reserved for the purchase of new equipment; we recommend that these provisions be embodied in all new general refunding mortgages, especially in view of the fact that the previous committee on railroad securities has gone on record that the railroads should make ample provision for adequate charges on account of the depreciation on equipment.

One of these provisions is that the company will maintain in good order, and when destroyed replace by other equipment of equal value, all equipment under the mortgage, and that in each case where bonds are issued against new equipment or additions and betterments to old equipment, the railroad shall pay to the trustee at or before the end of each year for a period of 25 years from and after the authorization or delivery of the bonds, a sum in cash equal to the difference, if any, between five per cent of the principal amount of bonds so issued and the actual amount which the company shall in such year have charged to operating expenses, to cover the depreciation of the equipment, for the purchase of which or for additions and betterments thereto the bonds have been issued; that is, if the railroad company should charge into operating expenses, say, three per cent of the cost of equipment or of betterments thereto in any one year against which bonds have been issued, the company must pay in cash to the trustee the difference between three per cent and five per cent, or two per cent, in that year, and so on for 25 years. All moneys received by the trustee under this covenant must be held by the trustee for improvements and betterments, acquisition of new equipment or the purchase of new securities, etc.

Railroads generally prefer to purchase equipment through equipment trusts, on account of the lower interest rates required. Another trouble is that underlying closed mortgages generally attach, by virtue of their "after-acquired-property" clauses, equipment purchased by bonds under refunding mortgages. A further trouble is that underlying mortgages which are not closed generally do not permit the issue of bonds for the purchase of equipment, although their "after-acquired-property" clauses automatically cover all equipment bought with bonds of junior issues. Only in comparatively recent general refunding mortgages are adequate provisions made for the issuance of bonds to buy equipment. Thus the situation is that on the one hand the railroad cannot buy equipment with the underlying bonds which command the best price, but must use a junior bond commanding an inferior price, and on the other hand the junior mortgage, which buys the equipment, cannot get an exclusive purchase money lien upon it. Therefore, if it is impossible to persuade the railroad companies to purchase equipment through the issue of general refunding mortgages containing such adequate provisions as have been recited above, and they insist upon issuing equipment trust obligations, there should be a provision in the general refunding mortgage that no bonds shall be issued on account of equipment acquired subject to any equipment trust. In this way, as the equipment trust obligations mature, the equipment comes under the general refunding mortgage or some prior mortgage.

There is no question on which there is a greater difference of opinion than the desirability of sinking funds in railroad bond mortgages, and while the conditions under which such mortgages are issued vary greatly, there is no doubt that the general principle of amortization of debts is a sound one, and today is more popular than ever among investors. The Interstate Commerce Commission requires the railroads to include in their operating expenses an annual charge for depreciation of equipment, but does not specify what in its opinion is proper, nor does it require the railroads to depreciate any other class of property. Only a few of the strongest roads depreciate any class of property other than equipment, and many of them charge off ridiculously low rates of depreciation, even on equipment.

Sinking Funds

There are some classes of railroad property, such as passenger terminal stations, subject to continuous depreciation which cannot be taken care of even by the full physical maintenance of the property. This depreciation is due chiefly to the normal growth of traffic, which, sooner or later, results in almost any terminal, however well designed, becoming inadequate and obsolete. Even though the building remains in as good physical condition as when constructed, its usefulness disappears, and by the time this occurs the debt issued to provide the cost of the property should be retired, except in so far as the value of the unimproved real estate is concerned. This same criticism applies to a certain extent to bridges, and also to branches or lines serving mines or other industries, the traffic from which is not permanent. Bonds issued against property of this nature should be protected by an adequate sinking fund provision sufficient to retire the bonds during the estimated life of the property or industry.

A large number of long-term railroad bonds are secured to some extent by lien on railroad equipment. The usual provisions for replacement and repair are not adequate to preserve the security, as it is not reasonable to suppose that equipment purchased today will be adequate to perform the service which will be required twenty years later, even though such equipment has been maintained at 100 per cent of its original condition. Railroad property of this kind becomes obsolete, and when this occurs its use by the road becomes wasteful. Bonds issued for the purchase of such property should be completely retired during the probable usefulness of such property.

Good management, proper maintenance and adequate depreciation charged to operating expenses unfortunately cannot always be relied upon. It is therefore necessary to adopt some method of safe-guarding bond issues—by which is meant providing annually out of income for their payment, in whole or in large part, at maturity. This is probably best accomplished by creating a small annual sinking fund. An annual payment of one-half of 1 per cent of the amount of bonds outstanding, compounded annually at 4 per cent, will provide for the entire issue in about 57 years and, if compounded at 5 per cent, in about 50 years. Such an annual payment is so small as to be almost negligible.

Strong objection is made to sinking funds on bonds secured by a mortgage on main track, exclusive of equipment or terminals. This objection, which is based on the necessity of the maintenance of such property and its freedom to a large extent from obsolescence, is valid and could not be answered were it not for certain other factors which are not always considered. In the first place, property of this character is not always maintained as it should be; therefore, sinking funds on bonds issued seem to be the only sure way of providing against a gradual deterioration of the property. We admit that this applies only to a limited percentage of railroad properties, but the fact remains that investors have lost large sums of money through such inadequate maintenance. In most cases of this character money that should have been spent on maintenance of the property has been applied to dividend payments. A forced sinking fund, while not insuring the maintenance of the property at full value, at least reduces continually the debt thereon and acts as a deterrent against the payment of dividends at the expense of the property.

One of the objections raised against the sinking fund by the railroads is that they are retiring bonds out of earnings through the operation of sinking funds while at the same time they are issuing other bonds probably under the same mortgage at a lower price for necessary additional capital. In this connection it has been suggested that the idea of a sinking fund might be varied by having it applied to the making of improvements instead of the retirement of bonds.

This method would probably be more advantageous from the standpoint of the railroad, and, if properly carried out, would maintain the equity behind the bonds. It would, however, result in losing one of the points in favor of sinking funds which is not sufficiently considered by the railroads; namely, the favorable effect on the market price of bonds on account of purchases for the sinking fund. It not only inures to the benefit of the bondholder, but enables the railroad to obtain better prices for subsequent issues.

Preventable Waste of Coal*

By David Moffat Myers

As a means of far-reaching economy the Government of the United States should at this time apply intelligent and direct-acting efforts to the conservation of fuel at the industrial plants which are responsible for its greatest consumption. Coal is wasted in vast quantities in the boiler furnaces of our plants, to feed which it is mined and distributed at a high and ever-increasing cost of labor and material.

The mining and distribution of the coal have been placed under the supervision of the War Coal Board in order more nearly to meet the crying needs in these directions, to use the railroad facilities more efficiently so that the present car shortage may be minimized to the greatest possible extent and to apportion the coal in quantity and to uses deemed most expedient. While this organized effort to bring about efficiency in the production and distribution of coal is being made, no parallel measures have been adopted to bring about a normal and practicable efficiency in its use. The hundreds of large plants which are consuming fuel wastefully, in many cases more wastefully and carelessly than ever before, are directly and needlessly causing a large fraction of the existing car shortage. They are overloading the already strained capacity of the railroads; they are rendering slower and more difficult the transportation of food and other vital commodities, and in short they are simply counteracting the measures of efficiency in production and distribution which have elsewhere been established.

Preventable Waste of Fuel

The preventable waste of fuel in the boiler furnace of one steel mill which I investigated amounted to 40,000 tons per year, which at $5 a ton would cost $200,000. This was a comparatively modern plant. The efficiency of boilers and furnaces in a 14-day test was 55 per cent. The load factor was unusually favorable to high efficiency and could readily be raised to 70 per cent or over. This is only one example and there are many more extreme cases. In one

*Abstract of a paper read before the annual meeting of the American Society of Mechanical Engineers.

hand-fired plant the evaporation was raised from 6 to 9 lb. in a few days of instruction and continuously kept close to this higher mark with the help of coal and water measurements which were inaugurated. The saving was due exclusively to instruction and consequent better operation.

The saving or wasting of one-fourth of the coal consumption of any industrial plant, depends entirely upon the efficiency of its operating management. Let me emphasize that this fraction of the consumption relates exclusively to the *boiler* plants, i.e., the production of steam; and does not include the large economies possible in connection with its distribution and use.

Under present conditions a plant which carelessly operates at an efficiency of 40 to 50 per cent, receives from the government the same consideration in the delivery of coal as the one whose efficiency is 70 to 75 per cent. This obviously is unfair and wasteful. The government hands over, say, 200,000 tons of coal a year to a plant owner, but asks for no accounting as regards its consumption, nor any questions as to the amount of steam it is made to produce. There is nevertheless an equivalent amount of steam this fuel is capable of generating and it can and should be made to produce that quantity.

There is no doubt that very important economies in the use of food have already been effected by the educational campaign with which we are familiar. These economies are largely the result of educating the ultimate consumer. The requisite propaganda spreads practical information concerning the efficient use of foods and their respective values and methods of preparation in such simple and convincing manner as to be understood and practiced by the women all over the United States. It places this information where it will be applied.

Conservation Methods

In general, there are, I think, two plans of operation worthy at least of consideration. The one might be termed the autocratic method. This would involve the use of authority to compel coal consumers to execute such measures of economy as the proper authorities might prescribe for any given case, limits to be set as to expense to the user. Such limits might be in terms of a percentage of his present yearly coal bill. Alterations should be directed chiefly, as previously implied, to purely operating improvements. Many objections would probably be made by consumers against this plan, but once in effect the majority would no doubt realize its pecuniary advantage to themselves. But its tendency may be too strongly opposed to democratic principles.

The other plan would be largely an educational one, in which patriotism and efficiency would furnish the motive forces required. The teaching must be accomplished with the utmost simplicity and directness. Above all, it must be in such form as to be readily comprehended and applied.

The United States Bureau of Mines has for a number of years engaged in obtaining and disseminating scientific information regarding the mining and consumption of coal, and the results of the work have been of great value to technical engineers who are able to use and apply it. It is evident that we now require an extension of the idea of education, but in such form as directly to affect the men who run the boiler plants of our country, for in their hands is the saving or wasting of one-fourth of the fuel which they consume.

Save One Million Tons of Coal

Six hundred million tons of coal were mined in the United States in 1916. It is predicted that 700,000,000 tons will be mined in 1917, and the production in 1918 will likely be still greater. Of this quantity approximately 67 per cent, or 469,000,000 tons, will be burned for steam-making purposes on land, assuming the same percentage consumption for the steam production as existed in the year 1915.

The saving or wasting of one-quarter of this coal, that is, over 117,000,000 tons, depends upon the efficiency with which we operate our boiler furnaces. If we actually saved by proper methods only 50,000,000 tons per year, this economy would result in freeing for other important service the use of 1,000,000 fifty-ton freight cars during the year. The significance of such an economy may be realized when it is stated that the number of cars thus released for other service would be equivalent to 15 per cent more than the combined yearly coal-carrying capacity* of the Baltimore & Ohio and Southern Railway systems; approximately equal to that of the Pennsylvania Railroad system on lines east of Pittsburgh, or 1 2/3 times the number of coal cars hauled by the Norfolk & Western. The direct saving to our industries would be $250,000,000 worth of coal per year, if figured at $5 per ton.

This saving would be 10.65 per cent of the coal now burned for steam production. It is impossible to state the present average efficiency of boilers and furnaces, but I have personally spent sixteen years of concentrated study in the investigation and improvement of steam and fuel conditions in factory power plants, and I have never visited a plant of this class where a saving in coal of at least 10 to 12 per cent could not easily be made. The poorer the conditions found the easier it is to make an attractive saving in fuel.

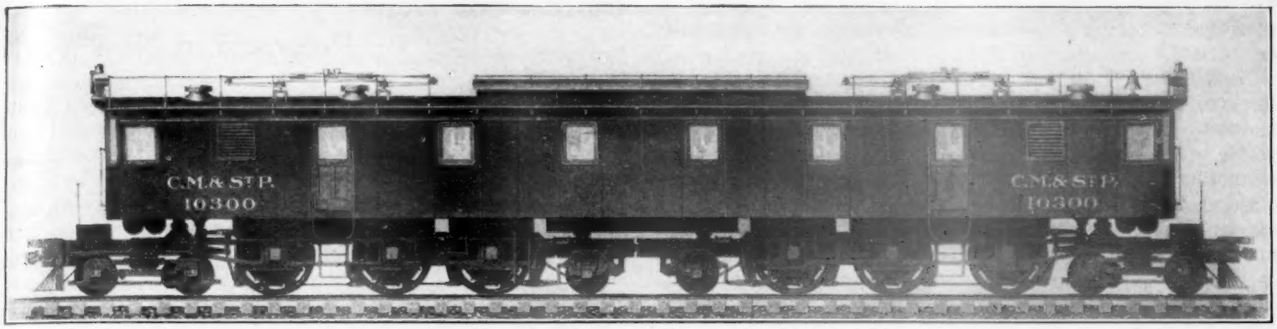
If we do not limit our field of action to coal used merely for steam generation, but extend it to include a consideration of the economy with which the steam itself is utilized and applied, there is no doubt in my mind that the above-predicted saving could be doubled, so that we might save 2,000,000 fifty-ton carloads of coal per year. There is, for instance, widespread ignorance to a surprising degree in regard to the value of exhaust steam in heating and process work. No account has thus far been taken of other primary uses of coal such as coke production, which consumes about 14 per cent of the output of our mines, and coal-gas manufacture, domestic purposes and miscellaneous. Additional economies could undoubtedly be effected in these applications.

Our steam plants are under the immediate management of chief operating engineers. The examination requirements for licenses in this profession call for practically no knowledge of steam and fuel economics. These examinations deal chiefly with matters of safety, repair and maintenance of equipment and neglect almost entirely the subject of coal economy. This is a very serious defect in our present system and is directly responsible for a large preventable waste of fuel.

The mining and distribution of our coal supply, the regulation of prices and the adjustment of financial and labor problems have already been placed under official administrative attention. But no parallel measures have been adopted looking toward reduction of waste in connection with the utilization of this coal. The work involved in a general program such as I have very briefly suggested will undoubtedly be undertaken. Its success or failure will depend chiefly upon the kind of men who may be selected for its planning and execution.

INCREASED OPERATING COSTS IN NEW SOUTH WALES.—During the year ended June 30 last, the awards of wage boards on the New South Wales Railways led to an additional outlay of £297,536 ($1,446,125), while the higher price of fuel cost an additional sum of £57,534 ($279,615), and of materials other than coal £89,388 ($434,426). The transportation of troops and of military stores at reduced rates, and the transfer of starving cattle cost £104,647 ($508,584).

*Based on statistics for the year 1916.



Powerful Electric Passenger Locomotive Having a Continuous Rating of 3,200 H. P.

Most Powerful Electric Passenger Locomotives

New Power of 112,000 lb. Tractive Effort and 3,200 H.P. for the Chicago, Milwaukee & St. Paul

THE CONTINUATION of the Chicago, Milwaukee & St. Paul's electrification program to the Cascade Range includes the electrification of a new section from Othello, Washington, east of the mountains to Seattle and Tacoma. With this completed there will be 611 miles of trans-continental electrified railroad in operation. The original 440 miles of electrification will eventually have all the passenger trains handled by Baldwin-Westinghouse electric locomotives. These locomotives embody many novel features.

The complete locomotive with a total length over couplings of 90 ft. weigh, ready for service, 266 tons, and has an adhesive weight of 330,000 lb. These new locomotives will be single-cab units, although the horsepower capacity is much greater than for any double-cab electric locomotive now in service. There are two main running gears, each having a four-wheel guiding truck, three driving axles with a 16-ft. 9-in. rigid wheel base, and a two-wheel trailing truck. It thus corresponds to two Pacific type running gears coupled with a link and having two-wheel trucks on the adjacent ends.

The cab is supported on center pins located midway between the first and second driving axles of each running gear. On one running gear the center pin is designed to restrain the cab both longitudinally and laterally, while on the other running gear the center pin restrains the cab only laterally, permitting free longitudinal movement. This arrangement of riding and floating pins relieves the cab of all pulling and buffing strains due to train load, as these strains are taken directly through the running gear side frames and bumpers. The driving wheels are 68 in. in diameter, and carry 55,000 lb. per axle. Guiding trucks have 36 in. wheels. The two-wheel trucks each have a load of 38,500 lb. at the rail, with approximately 62,000 lb. distributed on each of the four-wheel trucks.

On any single driving wheel, the non-spring supported weight is that of wheels, axles and driving boxes only.

With the flexible type of quill drive used the motors are located well above the roadbed and the axle with its wheels is free to follow the rail independently. This drive secures all the advantages of a flexible gear in cushioning the torque and avoids the shock to the rail that is obtained with the common flexible gear construction and mounting.

Each main running gear has three-point equalization with a single point toward the end of the locomotive, in accordance with accepted steam locomotive practice. The four-wheel guiding truck center pin and cross-equalized leading pair of driving wheels are equalized together on the longitudinal center line of the locomotive. This arrangement combines all the advantages of the standard construction of the American and Consolidation types of steam locomotives. The two remaining pairs of driving wheels and the two trailing wheels of the main running gear are equalized in accordance with accepted steam locomotive practice.

The center of gravity of the main running gear, including motors, is 41½ in. above the rail, and the height of the center of gravity of the complete locomotive is 63 in. above the rail.

Among the novel features which will be found in these locomotives are: Large capacity in single-cab unit; flexibility of running speeds with small rheostatic losses; twin motor design with quill drive; low-voltage auxiliaries simplifying inspection, maintenance and operation; simple and effective regeneration; improved equalization to minimize weight transfer in trucks, and auxiliary train-heating plant.

Capacity.—These will be the most powerful locomotives running in passenger service. A single unit is able to haul a 950-ton train (12 coaches) over the entire mountain section at the same speeds as called for by the present schedules. The one-hour rating for one of these locomotives is 4,000 hp. and its continuous rating is 3,200 hp. with a starting tractive effort of 112,000 lb. The normal speed on level track is 60 m.p.h.; on a 2 per cent grade about 25 m.p.h.

Flexibility.—One of the noteworthy characteristics of these units, which is very desirable in passenger service, but which has not heretofore been attained with this type of electric locomotive, except at the expense of heavy rheostatic losses, is the flexibility of running speeds. There are nine running positions without rheostatic loss. This is accomplished by the use of six 1,500-volt twin motors on the locomotive, arranged for three speed combinations as follows:

Position No. 1. 1 set 6 motors in series.
Position No. 2. 2 sets 3 motors in series.
Position No. 3. 3 sets 2 motors in series.

During the change from one speed combination to another, tractive effort is maintained.

Two additional running speeds are obtained on each speed combination by means of inductive shunts on the main motor fields, which assist in cutting down current peaks as well as save rheostatic losses, and enabling the power demand over the varying profile to be kept more nearly constant. The speed range is from 8 to 56 m.p.h., depending on the load.

Main Motors.—The use of the twin-motor design with quill drive not only permits the most effective use of the space between the driving wheels, but enables the use of two armatures each wound for 750 volts direct current, and geared to

the same quill. This also makes possible the advantage of better commutating characteristics inherent in the lower voltage motors.

Auxiliaries.—Low voltage auxiliaries considerably reduce the complication and hazard of high voltage on these locomotives. The only high voltage apparatus among the auxiliaries is the motor of the small motor-generator which is used for train lighting and charging the storage battery. The resultant simplification secured by the use of low voltage appliances decreases the complication of installation, maintenance and operation. Ordinary inspection can be carried on, including the functioning of switches and auxiliaries, with the complete absence of 3,000-volt power on the locomotive.

Regeneration.—The type of regenerative control for holding trains on descending grades used in these locomotives is of particular interest. Special arrangements have been perfected to secure positive operation of this feature over widely varying speeds. The same main motor combinations for "motoring" are used for "regenerating" except that the fields of the main motors are separately excited over a wide range by axle-driven generators. These are so connected with balancing resistance that inherent stability in the motor characteristics during regeneration is assured, irrespective of whether the changes in line voltage are sudden or gradual.

While the regenerative braking of trains lessens the duty on the air-brake equipment, further safety in braking with electric locomotives is introduced with the axle-driven generators. These machines are mounted on the pony trucks of the locomotive, and in addition to exciting the motors during regeneration, furnish the power for operating the air compressors and blower motors when the locomotive is hauling. This method insures a current supply to the air compressor motors irrespective of the overhead trolley supply, and provides that compressed air will always be available for use of the air brakes.

Weight Transfer.—In electric locomotives without connected wheels, weight transfer due to tractive effort, is an important point of interest. This is caused by the drawbar pull being exerted at the coupler height, which with the reaction at the rail, tends to lift the leading end and depress the trailing end. This changes the weight distribution and increases the tendency of the wheels to slip. The method of equalization described above reduces the weight variation on the driving wheels to only 6 per cent from normal when pulling at 30 per cent adhesion.

Train Heating.—The question of passenger train heating is of vital importance due to extreme weather conditions encountered in that section of the country. Heat must be assured under all conditions of failure of equipment, and delays of trains. The heating plant, therefore, must be entirely independent of the electrification. Each locomotive is equipped with an oil fired steam boiler, designed to burn ordinary fuel oil used by the railway company. Provision is made for a storage of 7,500 gal. of water and 750 gal. of oil in each engine.

The careful attention given to improve the details of design and operation insures that these new locomotives will mark an epoch in the development of the electric locomotive for steam railroad passenger service.

SELECTED ROUTES FOR BRITISH FREIGHT.—The Railway Executive Committee of England has given notice that on and after December 1, 1917, traffic for conveyance by freight train between England and Scotland, and Wales and Scotland, will only be accepted and conveyed by selected railway routes. Information as to the route by which traffic for places served by more than one railway should be forwarded, can be had an application to the railway coompanies' agents.

Store-Door Delivery Proposed in New York

THE DIRECTORS of the Merchants' Association of New York City have published a plan, prepared by J. C. Lincoln, manager of the association's traffic bureau, providing for store-door delivery of freight in New York City, combined with pick-up service; and the plan has been referred to the committee of commissioners who are investigating traffic conditions in New York City—Messrs. J. S. Harlan, of the Interstate Commerce Commission; T. H. Whitney, of the New York State Public Service Commission, and W. E. Donges, of the Public Utilities Commission of New Jersey. This committee has it now under consideration and is expected soon to recommend it to Mr. McAdoo. The plan involves some radical changes which, in ordinary times, could not be carried out without new legislation; and therefore the Merchants' Association seeks the approval not only of this committee, but also of the director-general of railroads. In the absence of legislation the plenary powers of the director-general would be needed to set the scheme in operation.

The report opens with a brief description of the extreme and unusual conditions in New York, especially on Manhattan Island; very inadequate team tracks and consequently large quantities of carload freight to be moved through the freight stations on the piers, and the enormous volume of business of all kinds, resulting in blockades of trucks loaded with outgoing freight very frequently even in normal times. Consignees, as a rule, call for freight only after they have received notice of arrival, and for the great bulk of the merchandise received in the city, this means a delay of at least 24 hours.

Store-door delivery—the trucking of freight away from stations as soon as practicable after its arrival, instead of awaiting the decisions of hundreds or thousands of consignees—is, of course, the ideal arrangement. The present report considers the question of getting each railroad to form a trucking company, and also another proposal that all of the roads should combine to form a company; but recommends, finally, the pooling of present equipment, which is owned by several hundred concerns.

With facilities consolidated the trucking company could have lined up on the pier batteries of trucks serving particular zones in the early hours of the morning and the delivery of freight would begin with the opening of business hours. The same method could be continued during the day. The pier station would thereby be kept free of incoming freight and more adequate facilities would be provided for outbound business. By this method deliveries would be made before the consignee, under present methods, receives notice of arrival.

Continuing, the report says:

"The same trucks should also be employed in picking up freight for outbound shipments. By proper co-operation on the part of shippers, a more even delivery of freight to the pier stations throughout the day could be accomplished and the frightful line-up and delays to trucks which take place in the late afternoon would be avoided. Trucks would be substantially assured of full loading in one direction and probably in both.

"At first the agreement, as a regulation, to be confined to the handling of less than carload merchandise.

"Carload receivers usually maintain their own trucks or have an arrangement with a trucking company to do their hauling; carload consignments could be kept intact and assigned a space on the pier floor where it would be accessible to the consignee. With the removal of the large number of trucks now handling less than carload freight from the

pier, the carload receiver could remove his freight more expeditiously.

"The following regulations would have to be prescribed and made enforcible:

"No trucks for the handling of less than carload merchandise other than the trucks of the company formed for the purpose of effecting store-door delivery to be allowed on the pier.

"Tender of the property to the consignee at his store door or usual place for the receipt of his property to be a legal tender of such freight, and upon such tender the consignee to pay freight and cartage charges before delivery. (Unless by prior arrangement he shall have arranged for credit.)

"If the property is refused by the consignee or payment is refused, then such freight may be placed in public warehouse.

"When delivery of merchandise is desired by consignee at other than his usual place of business, instructions shall be placed with the cartage company prior to the arrival of the goods.

"Schedules of reasonable cartage charges to be prescribed, which charges shall be strictly adhered to.

"Arrangements should also be made for the assessment of reasonable and non-discriminatory storage and handling charges on merchandise placed in public storage.

Method of Procedure

"In order to relieve congestion at stations and the delay to trucks the carrier should be required to make delivery of the property transported, subject to a reasonable charge for the additional service rendered. [This duty of the carrier being recognized, the authority of the director-general in the premises would be unquestioned.]

"The trucking service to be accomplished under government authority and direction, trucking companies now operating to be permitted to pool their equipment, so as to operate as one company for the handling of freight to and from railroad piers and stations. The city to be districted by zones as to piers and places of business to be served—and trucking equipment to be so regulated as to serve these particular zones. The trucking company to have priority rights on the pier.

"Where consignee desires to perform trucking, such trucks to be permitted on the pier in such restricted hours as will not interfere with the operation of the general plan." * * *

Wood Preserver's Association Studies War Conditions

The Shortages of Material and Labor Important Topics at the Fourteenth Annual Convention

THE CONVENTION of the American Wood Preservers' Association was held at the Hotel Sherman, Chicago, on January 22 to 24, inclusive. Although some doubt was expressed regarding the attendance previous to the meeting, the number present compared favorably with that of previous years. Approximately 75 members were in the hall at the opening session on Thursday morning.

The officers of this association for the past year were: John Foley, president, forester Pennsylvania Railroad, Philadelphia, Pa.; M. K. Trumbull, first vice-president, vice-president National Lumber and Creosoting Company, Kansas City, Mo.; J. B. Card, second vice-president, president Central Creosoting Co., Chicago, and F. J. Angier, secretary-treasurer, superintendent timber preservation, Baltimore & Ohio, Baltimore, Md.

The convention was called to order by President Foley at 10 o'clock on Tuesday morning, and was opened with prayer by J. H. Waterman, a past president. The report of the secretary-treasurer showed a balance of $149.77 in the treasury. The membership on December 31, 1917, was 291, including 73 members from 36 railways. Fifteen members were reported in the military or naval service of the United States government.

In his opening address President Feley referred to the unusual problems of the past year arising from shortages in oil, fuel, labor and lumber which are requiring extensive readjustment in the wood preserving industry. He referred to the recognition of this condition in the program for the meeting and urged the members to participate in the discussion of these problems in order that the wood preserving industry might do its full part in helping our government to win the war. He described the great inroads which are now being made on European forests, particularly those of the belligerent nations and referred to the large contribution which this country has made to the lumber demands of its allies. Owing to the depletion of the forests of Europe, the United States, Canada and Russia will be called upon to supply the timber needs of the world. President Foley also referred to the fact that 5,000 American foresters and lumbermen are already in France and emphasized the effect which this will have on the conservation of American timber resources after the war when these men return from Europe.

The War's Effect on Labor Supply

E. T. Howson, engineering editor of the *Railway Age*, spoke on the effect of the war on the labor supply. Although the labor problem is universal at the present time, no definite statistics are available showing the extent of the shortage of men. Such data as are available, however, indicate that the shortage is indeed serious. The causes of the situation are the increase in the demand for labor and the decrease in the available supply. The army draft increased the number of men who had already been withdrawn from industries through voluntary enlistments and the rapid growth of war industries also proved a heavy drain on the labor supply. On the other hand, the flow of alien labor into the country through immigration has almost ceased. Whereas in the 10 years previous to the war an average of 1,012,000 men available as unskilled laborers migrated from other lands to the United States every year, now hardly 250,000 enter the country annually and this number is nearly equaled by the exodus of alien reservists to fight in the armies of Europe. The two largest classes of immigrants are unskilled laborers and agricultural workers. Of the former class, 90,000 entered the country last year and 101,000 left.

Considerable attention has been directed to the Mexican labor supply, particularly in the Southwest. In the aggregate, however, this source of supply is unimportant as in no year have more than 20,000 Mexicans migrated to this country and since the passage of the alien labor law on May 1, 1917, almost a negligible number have entered. The only other source of labor is Asiatic, and although thousands upon thousands of Oriental workers have passed through Canada on their way to France to take over the unskilled

labor of that country, the United States Department of Labor has consistently opposed letting down the bars to permit the influx of that class of labor into this country, and not a single bill has so far been introduced into Congress to that end. The Department of Labor has, however, arranged to import 110,000 Porto Ricans for employment in this country. The big problem in this connection is to secure boats to transport these laborers. Up to date, bottoms have been supplied for about 50,000, who will be placed in the South, where climatic conditions are similar to those in their native land.

The Department of Labor has recently been given wide powers, among which is the authority to give certain industries, considered most essential to the prosecution of the war, priority in bidding for labor. Under present conditions some companies making large profits have not only outbid others for labor, but have followed the policy of keeping a surplus of labor on hand to provide for maximum needs, with the result that, from the standpoint of the country at large, there has been a considerable waste of man power. The Department also operates 100 labor agencies throughout the country which co-operate closely with 134 state agencies and give particular attention to the prevention of unnecessary movements of labor from place to place, and particularly, the transportation of men for long distances.

The employment of women is not a solution of the labor problem from the standpoint of the wood preserver, except in so far as they can be used in office work. Much more can be done, however, in utilizing the service of boys for light labor.

A remaining remedy for the labor situation is the further use of labor-saving equipment. Considerable success has been experienced in the use of locomotive cranes for the handling of ties. The further development of other labor-saving devices in this field is highly desirable at the present time.

Not only is it difficult to secure laborers at the present time, but it is hard to keep them. Commercial timber men have been able to bid higher than railroads for labor with the result that there has been a demoralization of the market. The degree in which the keen competition for labor has raised the standard wage of unskilled workers is indicated by the fact that in the recent storm in Chicago one or two railroads were forced to pay as much as $1 an hour to snow shovelers.

There is one way of keeping labor without further increasing wages and that is further attention to the comforts of the men. Comfortable quarters, sanitation and good food at labor camps are strong inducements for the men to stick to their jobs. In considering the labor problem it should be remembered that the present labor shortage may continue indefinitely after the war and that improvements introduced now may justify themselves as permanent qualities.

Discussion

C. M. Taylor (P. & R.) discussed the possibilities of the Hilke tie stacker, stating that lack of capital had hindered the development of this stacker. The Delaware, Lackawanna & Western, he said, had one of these machines in its yards which had not been perfected sufficiently to do satisfactory work. With reference to the labor situation, Mr. Taylor stated that the speaker had omitted mention of one source of supply, namely, the Portuguese, Spanish and Finnish sailors who spend considerable time at our ports waiting for their ships to sail. He said his labor was largely made up of these transient aliens. With reference to the negro supply of labor, he stated that the importation of blacks to the North should be discouraged as opposed to the economic and social welfare of that section of the country.

J. H. Waterman (C. B. & Q.) disagreed with Mr. Taylor's views on negro labor, asserting that under present conditions any one who could handle a tie was in demand and that the South should not have a monopoly on the negro supply of labor. On the subject of labor-saving devices, he said that while locomotive cranes were invaluable in a tie yard and he found them capable of loading from eight to nine stock cars a day through the side door, the price of cranes had risen from about $8,000 to $20,000 since the beginning of the war. In other words, both the cost of labor and machinery is high.

William A. Fisher (Michigan Wood Preserving Co.) described the operation of a monorail crane used by his company which is capable of handling a trainload of ties every two or three minutes. George E. Rex (A. T. & S. F.) said that he was using five cranes at the present time and wished he had five more. Cranes, he said, cut the cost of handling ties in two; in fact, without them he would not be operating today. A. L. Kuehn (American Creosoting Company) stated that his company had found that the cost of handling black ties could not be reduced materially by the use of locomotive cranes. Ties are received by his firm in closed top equipment, necessitating the use of practically the same number of men to move the ties from the interior of the car to the door and to arrange them in piles in the yards, as when cranes are not used. The only advantage of the crane rests in doing the heavy lifting work, thereby enabling the company to make use of a somewhat lower class of labor than when all the heavy work must be done by the men.

A. R. Joyce (Joyce-Watkins Company) related experiences of his company on tie operations where organizers from outside unionized the laborers with the result that the companies were compelled to recognize the union and raise wages. While he felt that the raise in pay was entirely justifiable the unions had produced unfavorable results in other ways. There was evidence of indolence and carelessness on the part of the men resulting in an increase in the number of accidents. President Foley called attention to the urgent need of the nationalization of any foreign workmen employed. He outlined the efforts made to teach new men the principles and ideals of our government, which led to the suggestion by M. K. Trumbull (National Lumber and Creosoting Company) that material assistance could be obtained by those concerned with this problem through co-operation with the American Committee on Nationalization, New York.

Bonus systems as a means of holding men were also discussed, especially the tendency for the men to leave as soon as the bonus was paid. Mr. Howson suggested that this could be overcome by paying the men a small increase in rates after a certain period rather than a lump sum bonus.

Conditions in the Tie Market

A general review of the tie situation was presented by M. T. Shanesey, general tie inspector, New York Central. He was followed by P. R. Walsh (Walsh-Griffith Tie and Timber Company), who gave an account of the conditions imposed upon the tie producer under the current shortage of labor and the high prices of all materials used. The shortage of ties is increased through a demand for lumber of small sizes for which tie timber is entirely suitable. As a consequence the portable saw mills are now being used largely in the production of this lumber.

W. H. Clifton (B. & O.) said that there were not enough ties in the east to meet the requirements and that he was now compelled to cover a much wider area in order to secure the necessary ties. F. S. Pooler (C. M. & St. P.) said that the railroads could help the tie situation materially by reducing their requirements and cited his own road which had reduced the tie renewals for 1917 by 450,000 from the estimates originally made. A. R. Joyce (Joyce-Watkins Company) said that the tie production in upper Michigan, Wisconsin and Minnesota, was less than 50 per cent of

normal and that practically all of the ties produced in this region are now being consumed by the railroads passing through it and as a result roads outside of the territory cannot get them.

Fire Insurance at Creosoting Plants

J. G. Hubbell, manager, National Inspection Company, gave an informal talk on the measures which can be taken to prevent fires. Orderliness and cleanliness were especially emphasized. Yards must be kept free from all rubbish, chips, etc. The lumber must be kept well piled and, where not objectionable from the standpoint of seasoning, should be piled solid.

Attention was directed to the fact that creosote was highly inflammable when heated and that the same was true of creosoted wood under a like condition. For this reason it is paramount to prevent accumulations of the oil on the floor around machinery, etc., and also to provide thorough ventilation to prevent accumulation of volatile gases. The boiler room requires special treatment. Sufficient head room must be provided over the tops of the boilers and special care is required where refuse is burned. The stacks should be screened and enough space be kept clear in front of the fire doors to do away with any danger of fires from that source. Machinery and shaft bearings must be kept clean. Many fires have been caused by the ignition of refuse in contact with heated bearings. Where artificial heat is necessary steam heat is far superior to any other from the standpoint of the fire risk, but even with steam heat precautions are necessary. Refuse must be kept away from the steam pipes and the racks on which the pipes are placed should be made of iron and not wood.

The last part of the talk was devoted to apparatus for fighting fires, including the water works system, pipes, hydrants, hose, etc. In the case of a creosoting plant a pile of sand should be kept convenient to the operating buildings for fighting oil fires.

In the discussion of this paper J. H. Waterman (C. B. & Q.) described the measures taken at the Burlington plant at Galesburg, Ill., to decrease the fire hazard and where, with the existing conditions the insurance company fixed a rate of $1.18, after the improvements and rearrangements had been made, a rate of 59 cents was obtained. Dr. Hermann Von Schrenk (consulting timber engineer) called attention to the important bearing of the moral hazard, stating as his opinion that carelessness, indifference and ignorance had far more to do with fires at creosoting plants than the materials.

The Creosote Situation

R. Esau (Barrett Company) gave a short talk on the available supply of creosote. Insofar as the domestic supply is concerned the chief difficulty at the present time is that the coal shortage has resulted in the extensive use of coke-oven tar as a fuel, it being estimated that 1,250,000 bbl. per annum are being consumed at the present time in connection with steel manufacture, so that refiners are unable to obtain an adequate supply. Three or four years ago it was the opinion of those connected with the coal tar products industry that the great volume of the supply of this material would be a serious problem to the producer and manufacturer because of the difficulty of securing an adequate market. The present conditions present an absolute reverse of this situation. The shortage is acute, as a forecast it was believed that the production of creosote for 1918 would be less than 1917.

E. B. Fulks (American Tar Products Company) confirmed Mr. Esau's statement in that the best to be expected was a production in 1918 practically equalling that of 1917, with the difference that with the beginning of last year, a surplus of 12,000,000 to 15,000,000 gal. of creosote was on hand whereas there is no such supply at the present time.

G. A. Lembcke (Lembcke, von Bernuth Company) gave some information concerning the supply of foreign creosote. Aside from the embargo placed by the British government on the exportation of this material, coal tar is now being used for a fuel in England even to the prohibition of its use for many other purposes. Following the close of the war a large supply of creosote should be available from England and transportation will be the most serious problem since the supply of shipping enters into the situation.

Cause and Prevention of Failures in Creosoted Wood Block Factory Floors

By L. T. Ericson,
Contracting Engineer, The Jennison-Wright Company, Chicago

This paper touched on the success with which these floors have been used in all manner of industries but stated that occasional failures are encountered and that the problem confronting this industry at the present time is to study these occasional failures with a view to a discontinuation of any practices which are found to cause them. The principal problem arises from the need of providing for both expansion and contraction, the former causing a floor to buckle and the latter to make it rough and shorten its life. Adequate expansion joints are required around the edges of the floor and also between the individual blocks through the use of fillers. Special attention was called to the necessity for differentiation in the treatment of blocks, in handling them on the job and in laying the floor, to provide adequately for the great difference in the behavior of blocks laid in dry surroundings and those subjected to wet or humid conditions.

Air seasoned lumber, stable foundations and a bitumen filler were named as the primary requisites for success in any case. For the foundation, concrete is the best and the practice of providing a level or uniform surface was commended as doing away with the necessity for the sand cushion which serves no other purpose than to provide a level surface for the placing of the blocks. A cushion is not required to take up vibration. The most difficult job of all is the placing of the filler. Good workmanship and adequate supervision are necessary if correct results are to be secured.

Discussion

Walter Buehler (Barrett Company) emphasized still further the necessity for a distinction between interior wood block floors subjected to different kinds of service and that the blocks to be used in dry interiors must be handled entirely different than those which will be subject to wetting or high humidity after being laid.

Other Reports

Dr. Von Schrenk talked briefly on the effect of the war on the supply of timber of various sizes. Between July and September the consumption of wood in this country was carried on at an enormous scale. The construction of the cantonments entailed the cutting, manufacture and shipping of lumber at most remarkable speed and while this work interfered to a considerable extent with available supply of lumber for other purposes, the situation was not so serious as that now produced by the shipbuilding activities which demand the use of all available mills and men.

Because of the need for a large amount of material of certain sizes embargoes have been placed on the shipment

of yellow pine and fir in the larger sizes for other purposes than ship building. However, in any case where the use of material for special purposes can be shown as a definite need, it has been found possible to secure the release of the necessary material by application to the special branch of the Council of National Defense, or through the lumber associations.

The annual report of the committee on service tests was presented by P. R. Hicks (Forest Products Laboratory). This consisted of a statement of the progress being made in the selection, compilation and tabulation of data on the life of untreated ties and those treated according to various processes.

The condition of creosoted wood block pavements in Mobile, Ala., Shreveport, La., and a number of Texas cities was the subject of a paper presented by C. H. Teesdale (Forest Products Laboratory) who had been commissioned to investigate certain failures of pavements in these cities. His conclusion is that poor workmanship, particularly as to laying and application of fillers, was primarily responsible.

Volume Temperature Correction for Creosote Oil Measurements, a paper by S. R. Church (Barrett Company) and J. M. Weiss was presented by the former. The report of the Committee on Terminology was presented by the secretary and consisted of a glossary of the technical terms used in the wood preserving industry. It was suggested that criticisms or additions to this glossary be submitted to the chairman of the committee.

Other Business

At the closing session on Thursday, the following officers were elected for the ensuing year: President, M. K. Trumbull, vice-president, National Lumber & Creosoting Company, Kansas City, Mo.; first vice-president, J. B. Card, president, Central Creosoting Company, Chicago; second vice-president, A. R. Joyce, Joyce-Watkins Company, Chicago; secretary-treasurer, F. J. Angier, superintendent of timber preservation, Baltimore & Ohio, Baltimore, Md.; members of the executive committee, E. B. Fulks, vice-president, American Tar Products Company, Chicago, and E. T. Howson, engineering editor, *Railway Age,* Chicago. It was voted to hold the next annual convention at St. Louis. The annual dinner was held on Wednesday evening.

BRITISH WAGE DISPUTE SETTLED.—The delegate meeting of the National Union of Railwaymen of England on November 29 agreed to accept a revised offer of the Railway Executive for a flat rate advance of 6s. ($1.44) per week to men and 3s. ($.72) a week to women and youths under 18.

INTERNATIONAL TRADE OF 1917 will show a larger total than in any earlier year, says a bulletin of the National City Bank of New York. In the case of the United States the total trade of the year is estimated at approximately nine billion dollars, against less than four billions in 1913.

TANKS TRAVEL BY TRAIN.—Some interesting details regarding the "railification" of the British front in France were recently given by a special correspondent of the London World. Some of the existing lines, he writes, have been double-tracked and others quadrupled, and "in places the sidings remind one of the big railway junctions in England, as they would look were all the permanent buildings removed and only the lines left." The British Army has added to and improved the rolling stock, and British locomotives from all lines, all painted black, are to be seen everywhere. The trains are described as "interminably long," traveling at a very slow pace, due to the innumerable stops, and the number of mixed consignments handled. The writer adds, "How many people are aware that tanks travel to the front by train?"

Increased Efficiency by Use of Train-Order Form Nineteen

By T. H. Meeks

General Agent of the The American Railway Association, Camp Logan, Texas

NOTWITHSTANDING the wonderful progress that has been made towards more efficient and economical operation of the railroads since the beginning of the world war, the volume of traffic has increased so rapidly and to such extent that innumerable difficulties are still being met in handling it with the degree of promptness and regularity necessary to the successful conduct of the war; and every road must therefore be organized and systematized so as to develop the maximum of efficiency; this in order that it may be utilized to the limit of its possible usefulness. The increase in efficiency that has been accomplished thus far is principally the result of better utilization of motive power, reduction of delays to cars, and better car-loading. The railroads and the people have responded willingly and promptly to this emergency. But a much greater concentration of effort in this direction is necessary to help make the available supply of cars and engines carry the present increased traffic; no road can secure new rolling stock in sufficient quantities to meet the demand.

The greatest item of unnecessary expense, and hindrance to traffic on a busy railroad (I say busy railroad because the loss is more noticeable on trunk lines where the traffic is dense) that apparently has not been dealt with in any far-reaching way is the stopping of trains for despatchers' orders. This expense and delay could be greatly reduced by curtailing or eliminating the use of train order form 31 (which requires the stopping of trains for the signature of the conductor). The only time it is necessary, from a point of safety, to stop a train for an order is *when execution is required at or in the vicinity of the station at which it is issued.*

The majority of railroads, particularly single track lines, continue the use of form 31 for restricting the superiority of trains. The reason usually advanced is that it is safer than form 19 (which does not require the stopping of trains for the signature of the conductor), although the unrestricted use of form 19 is authorized in the standard code of train rules of The American Railway Association. Its use has proved successful on several railroads which are using it almost exclusively; furthermore, the railroads that are using form 19 for restricting purposes consider it superior to form 31 for the reason that it obviates the following undesirable features in the movement of trains by train order:

(1) Need of protecting the rear end when trains are stopped (see rule 99);
(2) Delay in stopping and starting;
(3) Cost of fuel and water in starting;
(4) Wear and tear to equipment by stopping and starting;
(5) The inferior requirements with respect to the delivery of form 31.

Not only is form 31 undesirable in the five particulars just enumerated, but it also causes serious delay to inferior trains at meeting points with superior trains on account of despatchers (on many railroads) not being permitted to stop through passenger or freight trains, when only a few minutes late, to deliver a 31 order, whereas, a 19 order could be delivered to a superior train without stopping it, and the delay to the inferior train thereby reduced. Reducing delay at meeting points would, in a great many cases, prevent trains from freezing in cold weather, and it would prevent numerous sixteen-hour-law tie-ups which are extremely expensive. Despatchers have frequently been known to violate

the rules under which they were working, and use form 19 for restricting the superiority of trains; or they would instruct operators to sign the conductor's name to orders (which amounts to the same thing), to avoid excessive delays. Division officers wink at these practices. All of this is conclusive evidence that the procedure under form 19 is preferable for general use.

It is doubtful if a correct calculation of the unnecessary expense and delay incurred through the use of form 31 could be made, but it is obviously enormous; and the needed steps should be directed to its elimination.

Issuance of Train Orders

The principal features in the issuance of a train order are the correct receipt and repetition by the operator, and correct check by the despatcher while it is being repeated to him. In these respects there is no difference between form 19 and form 31.

Delivery of Train Orders

The principal features in the delivery of train orders are:

(1) The proper display of the train order signal.

(2) Recognition of the signal by trainmen and enginemen.

(3) Receipt of the order by trainmen and enginemen.

As to point 1 there is no difference between form 19 and form 31. As to the second there is this difference; the operator, in the case of form 31, remains in his office, leaving the recognition of the signal entirely to the men on the train; he is not required to do anything but wait until the conductor reports; while in the case of form 19, he is out on the platform to make personal delivery of the order. He is required to have with him hand signals for the purpose of signaling the approaching train in case the train-order signal should fail or not be properly observed. As to point 3, the operator is an active agent in the delivery of the 19 order and, therefore, there is a greater assurance of delivery. If the order is legibly written and if delivery is made, it is as certain of execution under one form as under the other.

In making delivery of a restricting order to a train at a non-train-order station, or train-order station at which the operator is not on duty, in care of another train, either of the following methods could be adopted for taking receipt for orders thus delivered:

(1) Form 31 could be used for this purpose.

(2) A receipt could be taken on the face of form 19 without this form being modified.

(3) A universal form of order could be adopted to take the place of forms 19 and 31 for all purposes, the procedure in making delivery to be the same as with present form 19 except to provide a space for the signature of the conductor or engineman of trains receiving restricting orders at places other than open train-order stations.

Under the second or third method only one form would be required where two are now required. This would make a saving in stationery and would simplify the handling of trains by train order. Under any of the three methods, the receipt would be turned in at the next train-order office for transmission to the despatcher, so that the order could be delivered to the inferior train or trains affected.

Where it is not desirable to revise the rules and revolutionize the train order system, form 31 could be used in cases where execution is required at or in the vicinity of the station at which the order is issued; also for orders sent to a train at a non-train-order station (or train-order station at which the operator is not on duty) in care of another train, which restricts its superiority or otherwise imposes an obligation.

Where form 19 is used, the clearance card is indispensable. At the beginning of the use of a form that required the signature of the conductor and engineman (which was later modified to require only the signature of the conductor, so as to eliminate part of the delay) the clearance card was not used; nor was it necessary, as the signature on the order was sufficient evidence of delivery. When form 19 was promulgated it was then necessary to provide evidence of delivery, hence the clearance card; the conductor and engineman were required to check the numbers of the orders received against the numbers shown on the clearance card to ascertain if all had been received.

Relation of Clearance Card to the 19 Order

Some railroads are using a form of clearance card that requires the despatcher's O K before being issued to a train; the operator when asking permission to clear a train, is required to repeat to the despatcher the numbers of the orders on the clearance card, and the despatcher is required to check the numbers given by the operator against the orders outstanding at that office, to insure that none have been omitted; after which he gives the O K; and the operator then clears the train in the usual manner. It would provide an additional element of safety if clearance cards were numbered by despatchers, the same as train-orders, thereby making it impossible for an operator to properly clear a train without the despatcher's permission.

This method of handling clearance cards places the responsibility for delivery of orders on both the despatcher and the operator instead of on the operator only, and deserves careful consideration. If frequent surprise tests were made to keep despatchers and operators on the alert, the chances for failure to make delivery would be even more remote.

Mexican Railroad Properties in a Ruinous Condition

THAT THE RAILROADS in Mexico are going to rack and ruin is the opinion of an observer sent by the New York Sun into Mexico from Vera Cruz. The first special despatch sent by this observer from Havana, printed and copyrighted by the Sun in its issue of Tuesday last, paints a picture of Mexico that is thus summarized in the leading paragraph: "Mexico is starving and bleeding to exhaustion. There seems no present help for it, so obsessed is she with the idea, encouraged by tireless German propagandists, that the United States is her natural enemy, but negligible because Germany is sure to win the war and will thereafter be Mexico's great and good friend."

The Sun's observer discusses the situation in Mexico from all angles. Concerning the railroads particularly he says:

"The railroads are in bad shape; none of the rolling stock has been painted since the revolutions started, and from the looks of the cars no repairs have been attempted. The Vera Cruz & Pacific is not in operation; traffic with the Isthmus of Tehuantepec must now go by boat from Vera Cruz to Puerto Mexico.

"The Interoceanic has been closed down almost from the beginning and no one knows in what condition the line is. The Mexican Central line from San Luis to Tampico has been abandoned, it being impossible to get even a military train over it. From Mexico City to Queretaro the Mexican Central as it parallels the Mexican National Railway has ceased to exist—nothing remaining but culverts and the right of way; ties and rails have entirely disappeared.

"From Vera Cruz to Cordova on the "Queen's Own" railway, the right of way is lined with wrecked and burned cars. They operate this line by daylight only, the territory from Vera Cruz to Orizaba being subject to the attacks of raiding bands. The passenger train is preceded by a pilot train of

three box cars and an engine, with 150 soldiers. The train itself carries three more cars of soldiers and there are small garrison posts along the line some fifteen miles apart. In spite of these precautions the train is raided about every ten days.

"The passenger train from Mexico to Laredo carries three box cars of military escort. At Queretaro, in which Gen. Coss and Gen. Luis Gutierrez, with his brother, Gen. Eulalio Gutierrez, one time President of Mexico, recently set up their own revolutionary standard, they add a pilot train with soldiers. At San Luis Potosi they increase the escort and attach an armored train to the rear of the passenger. Thus the train proceeds in to Monterey. That is it does with any kind of luck and if no one has taken up the rails. At present writing some three kilometers of rails have been removed by the revolutionists beyond Saltillo.

"The line from Monterey to Tampico is kept open most of the time. Over this line the fuel oil for the Central Railways is hauled. It is subject to raids by Gen. Juan Andrew Almizen between Linares and Victoria. Trains run heavily guarded, but the right of way is strewn with wrecked and burned car bodies.

"The railroad shops in Monterey have a small force of men working, but the yards are filled with rusting locomotives, while on sidings in the freight yards stand the gaunt frames of over 800 cars all burned at one time by one of the revolutionary generals. . . ."

"There are one or two commission houses and a mining company that have been carrying on business by owning their own trains, locomotives and cars and employing their own crews. In this manner they have succeeded in bringing in supplies over roads on which the national government could not operate trains.

"Early in December one of these privately owned trains was held up near Queretaro by an independent band of bandits. While going through their regular performance of looting the train the bandits came to one car which was securely locked. One of them with an automatic pistol fired into the lock. The car had contained forty tons of dynamite. When the smoke and dust cleared away and things ceased falling the train and some 120 bandits had gone away from there, only a large hole indicating where they had been.

"In spite of such casual losses as this the firms operating their own trains are said to be making money and the bandits continue to flourish."

Work of the Railway Engineers

IN HIS TESTIMONY before the Senate Committee on Military Affairs on Monday, January 28, Secretary of War Baker described in a general way the work of the railway engineer regiments now in France. Secretary Baker said in part:

"In a very short time we had organized engineering regiments of railroad men and sent them over there and were rebuilding railroads which were being carried forward with their advance; reconstructing their broken engines and cars, building new railroads, both back of the French and British lines, and those regiments were of such quality that at the Cambrai assault, carried on by General Byng, when the Germans made their counter attack, our engineer regiments threw down their picks and spades and carried their rifles into the battle and distinguished themselves by gallant action in the war itself.

"It was suggested that further groups of mechanics might be needed. We began to see that we were going to be over there in large force, and the question that then had to be answered was, How will we maintain an army in France? Special studies had to be made of that problem, and this is what they showed: They showed that the railroads and the facilities of France had during this war been kept in an excellent condition; far better than any supposed possible under war conditions; and yet that those railroads were used to the maximum to take care of the needs of the French and the British themselves, and that when our army became a great army it would be necessary for us to build back of our own line an independent line of communication.

"For instance, the French had naturally reserved the best ports in France for their own supply. The Channel ports have been reserved for the British. When we came in it was necessary for us to have independent ports of entry in order that there might not be confusion and admixture of our supplies, going through these ports of disembarkation with those of other nations. We were given several ports. As you perhaps recall, the ports of France are tidal ports, ports with deep water and tidal basins at high tides, with insufficient water for landing at the docks when the tide is out.

"As a consequence, the construction of docks and wharves in ports of that kind is very much more difficult than where you have a deep sea harbor, and all you need to do is to erect a pile wharf. We have had to build docks, we have had to fabricate in this country and send over dock handling machinery; we have had to send from this country even the piles to build the docks. We have had to have gantry cranes, manufactured in this country, sent over to be erected on those docks; we have had to erect over there warehouses at the ports of disembarkation in order that these vast accumulations of stores and supplies which go over, can be properly housed and cared for, until they can be distributed into the interior.

"We have had to take over and are in process of rebuilding and amplifying a railroad 600 miles long in order to carry our products from our ports of disembarkation to our general bases of operation. And all of that has to be done, not only studied out, as a necessary thing to do, but when so studied out and reported here, the manufactories for those things have to be carried on in this country and the things shipped over there—nails, crossties, spikes, fishplates, engines, cars, buildings.

"That great staff under General Pershing's direction, containing so many men from the American army enriched by captains of industry and masters of technical performance in this country, all of these large industrial operations under general direction, such as the railroad and dock buildings, under a former vice-president and now a vice-president perhaps of the Pennsylvania Railroad. Atterbury and men of that quality and experience, summoned in to aid him—those are the men who are carrying forward these operations, which are quite as expensive as those which are carried on over here, and of far greater difficulty, because it means getting material by cable as to sizes and specifications, having it fabricated here and sent across through those infested 3,000 miles of ocean and then set up on that side."

WHERE U. S. COAL WENT IN 1917.—Of the 32 million tons of coal passing out of the United States in the fiscal year 1917, over 17 millions went to Canada, while another 8 millions passed into the bunkers of vessels engaged in foreign trade. This 17½ millions exported to Canada is the largest in the history of our trade with that country, and is valued at $58,000,000, about one-fourth of the quantity being anthracite. Italy ranks second in the list of countries to which we export, the total to Italy in 1916 being nearly 3 million tons. Cuba ranks third, the exports to that island being about 1½ million tons in 1917; Panama about one-half million tons, most of which, however, is for the coaling station at that point; Argentina and Brazil about three-fourths of a million tons each, and Uruguay 100 thousand tons.—*Bulletin of the National City Bank of New York.*

General News Department

The freight house of the Missouri Pacific at Fifteenth and Nicholas streets, Omaha, was destroyed by fire on December 28; not the freight house of the Union Pacific, as previously reported.

"The International Car and Locomotive Workers and Railway Mechanics," also called the Brotherhood of Railway Mechanics, is an organization, real or imaginary, which the merchants' Association of New York City has investigated and has not been able to locate. Members of the association are cautioned to be certain of the facts before contributing to solicitors representing these "mechanics."

The Bureau of Explosives and its inspection forces have been designated as agents of the United States Bureau of Mines to assist in the enforcement of the law of October 6, 1917, regulating the manufacture and use of explosives in time of war; and W. S. Topping, assistant chief inspector of the Bureau of Explosives, 75 Church street, New York City, has been appointed executive assistant to F. S. Peabody, assistant to the director of the Bureau of Mines. Mr. Peabody desires that all matters pertaining to the law regulating explosives, so far as they apply to transportation companies, shall be dealt with by Mr. Topping; and correspondence should be sent to him at New York City.

The "blizzard" in the Central West on January 26 disappeared on the following day. The storm was sufficiently severe, however, to delay the arrival of trains in Chicago on Saturday evening by from one to six hours and to cause the annullment of a large number of passenger trains. Outside of the obstacles created by the weather conditions on the 26th, the flow of coal into the Chicago terminal district has been uniformly heavy during the past week. In the 48 hours ended at midnight, January 28, 155 cars of anthracite, 1,523 cars of bituminous coal, and 95 cars of coke were received in Chicago. During the week which ended on the same day, there were total receipts of 1,225 cars of anthracite, 8,708 cars of bituminous coal, and 823 cars of coke.

The Longshoremen of the Southern Pacific Company, at New York City, to the number of about 1,200, quit work on Saturday, January 26, demanding the same rates of pay as prevail on the docks of the Transatlantic vessels and complaining also that the company has broken an agreement. Officers of the longshoremen's union declare that they tried to dissuade the men from striking. The Southern Pacific reaches New York only by steamer; and as this steamship line may be classed as an adjunct of the company's railroad, which is now under the control of the federal government, it is conjectured that these strikers may find themselves interfering with the activities of the government.

Railway Regiments' Tobacco Fund

During the past week one contribution to the Railway Regiments' Tobacco Fund of $10 a month for 12 months was received from the Ohio Steel Foundry Company, of Lima, Ohio.

Malicious Misrepresentation

Many railroad men were much surprised at a statement which was widely printed in the Saturday afternoon and Sunday morning newspapers, and which was attributed to Commissioner C. C. McChord, that: "Gross negligence of railroads under private management in giving proper care to locomotives is a principal cause of the present freight congestion." Commissioner McChord was quoted as announcing that "hundreds of locomotives which are sorely needed in the present emergency are idle in shops and roundhouses, frozen through neglect or lacking repairs which might have been made if proper forethought had been given by local railway officials."

Mr. McChord did not make such a statement. A Washington newspaper correspondent apparently drew the inference after looking over a copy of Commissioner McChord's daily congestion statement.

Serious Results of Storms in New York, Pennsylvania, West Virginia and Elsewhere

The long-continued low temperature and repeated snows have caused serious additional congestion on the railroad of the Eastern district. The number of loaded cars in transit, eastbound, on Tuesday the 29th, was 64,286. This is an increase of 7,930 cars, as compared with the day before, and this increase measures the clogging effect of the snows and low temperatures. There was also an increase in the number of empty cars moving eastward and in both oladed and empty westward.

Regional Director A. H. Smith reported that in West Virginia 1,100 miners had been employed by the railroads to shovel snow; and in all of the snow-covered regions every available man was hired to help clear the tracks.

On Thursday and Friday of last week there was considerable improvement in the movement of freight throughout the Eastern district, and hopes of relieving the general congestion were revived; but by Monday the 28th, new snowfalls and low temperatures had neutralized all of the gains which had been accomplished. The experiences of the preceding week—freight traffic suspended and passenger trains many hours late—were repeated on all of the principal roads.

The Pennsylvania Railroad on Monday the 28th found itself in the most difficult position in many years; more difficult than in any winter since the time, years ago, when the volume of traffic was only a fraction of what it is today. Passenger trains were stalled all along the line between Philadelphia and Pittsburgh; and near Gallitzin, one was held immovable by the derailment of its engine. Even at the Broad street station, Philadelphia, train movements were seriously hampered by the impossibility of securing enough men to keep the switches in working order. On Monday afternoon all through-trains westward from Philadelphia were annulled. On Tuesday evening the road issued a statement which said:

"A force of 25,000 men was kept busy all day toda clearing the running tracks, sidings, and yards of the snow which fell on Monday. About 2,500 of the entire force of snow shovelers were extra men hired for the day. The remainder comprised track laborers, carpenters, shopmen, signal repairmen and other employees pressed into emergency work. Several hundred supervisors, assistant supervisors, draftsmen and office men were sent out as extra foremen to take charge of the snow shoveling gangs.

"As the result of these efforts the entire main line was opened up by sundown tonight (Tuesday), with the exception of about half a mile of No. 3 track, just west of the tunnel at Gallitzin, and a similar stretch of No. 4 track at the east end of the tunnel. The sides of the drifts which have been cut through at the tunnel show a depth of eighteen feet.

"All of the principal yards were cleared today and their frozen switches placed in operation, with the exception of the Conemaugh, Pitcairn, Derry, Marysville, and Altoona yards, at which partial operations were resumed this afternoon. Assistance in clearing the Washington terminal was rendered by 150 soldiers from Camp Meade, Maryland. Freight movement was resumed today on the Pittsburgh division with short trains. Some bituminous coal has been moved east. . . ."

In Kentucky and throughout a large territory tributary to the Ohio River floods and floating ice did extensive damage this week. In Eastern Kentucky a number of railroad bridges were carried away. On the Pocahontas division of the Norfolk & Western traffic was suspended because of washouts. Considerable sections of this, the Chesapeake & Ohio, and other roads were expected to be closed to traffic for two or three days. The Ohio River rose so rapidly, and the flood was so full of floating ice that many boats and barges were damaged or lost. According to one estimate, the losses of water craft may reach $2,000,000.

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS CALENDAR YEAR 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Detroit, Grand Haven & Milwaukee	190	$2,124,873	$404,910	$3,042,557	$436,693	$502,506	$59,953	$1,821,994	$70,664	$2,892,054	95.05	$150,503	$41,457	$109,045	—$327,613
Detroit, Toledo & Ironton	441	2,140,415	142,571	2,465,944	301,347	425,412	49,493	405,472	87,158	2,268,883	92.01	197,061	88,000	107,760	—342,335
Duluth & Iron Range	269	6,768,180	221,090	7,214,208	1,035,877	877,288	17,517	1,932,566	197,908	4,079,485	56.55	3,134,723	666,495	2,468,228	—739,661
Duluth, Missabe & Northern	413	13,847,089	363,443	14,961,564	1,693,245	1,246,032	35,041	3,168,774	496,858	6,655,141	44.48	8,306,424	2,445,294	5,861,129	—2,068,572
Duluth, South Shore & Atlantic	601	2,732,129	979,488	3,991,869	728,007	504,561	81,811	1,694,916	101,413	3,158,767	79.13	833,102	186,199	646,879	—121,709
Duluth, Winnipeg & Pacific	175	1,582,959	261,486	1,889,416	190,518	244,033	29,702	844,858	81,429	1,397,119	73.94	492,297	94,452	397,841	—51,275
Elgin, Joliet & Eastern	805	13,596,452	142	14,621,785	1,306,797	3,476,640	92,240	5,082,893	306,254	10,256,927	70.15	4,364,857	569,801	3,794,994	—716,045
El Paso & Southwestern Co	1,028	9,625,827	2,189,189	12,459,001	1,172,720	1,483,775	228,773	3,371,760	327,195	6,665,020	53.50	5,793,981	485,071	5,308,690	—23,335
Erie	1,987	49,883,787	8,987,886	65,672,976	6,247,476	15,896,941	1,062,432	29,784,438	1,447,887	54,839,288	83.50	10,833,688	2,540,625	8,274,435	—6,185,805
Florida East Coast	765	3,950,088	2,378,572	7,483,634	748,887	942,813	92,211	2,249,920	172,964	4,085,805	54.60	3,397,829	505,956	2,891,321	—757,550
Fort Worth & Denver City	454	4,032,722	1,535,036	5,892,053	509,054	1,020,862	82,865	1,750,300	196,229	3,591,980	60.96	2,300,073	420,000	1,879,964	—94,221
Galveston, Harrisburg & San Antonio	1,360	12,852,553	4,067,322	17,908,972	2,144,857	2,240,438	369,483	5,699,404	441,586	10,960,734	61.20	6,939,237	1,058,238	5,867,052	1,807,153
Galveston Wharf	13	.....	.....	1,000,038	11,929	12,552	3,325	286,154	9,471	562,562	56.25	437,476	145,200	292,276	—211,709
Georgia	334	2,531,816	1,010,328	3,829,504	309,859	549,910	154,771	1,474,545	102,904	2,592,890	67.71	1,236,614	65,306	1,171,159	232,630
Georgia Southern & Florida	402	1,529,535	838,360	2,654,619	366,438	583,762	79,861	964,743	103,492	2,103,341	79.23	551,278	157,905	391,640	—78,275
Grand Rapids & Indiana	575	3,887,894	1,567,567	5,986,981	705,516	1,067,397	112,940	2,681,206	213,029	4,798,628	80.15	1,188,353	265,886	921,892	—143,736
Grand Trunk Western	347	6,618,816	1,498,283	8,839,803	1,048,398	1,650,448	183,153	3,915,550	225,057	7,090,359	80.21	1,749,444	410,692	1,338,752	—1,063,851
Great Northern	8,261	59,466,144	14,538,553	81,649,320	11,089,883	10,980,667	1,187,221	29,025,417	1,377,731	54,305,882	66.51	27,343,438	5,516,559	21,822,388	—4,778,114
Gulf & Ship Island	307	1,582,550	408,944	2,126,156	302,971	292,860	37,199	638,392	91,400	1,365,023	64.20	761,134	146,972	613,897	15,734
Gulf, Colorado & Santa Fe	1,937	11,325,568	3,279,846	15,619,286	2,849,839	2,182,305	325,247	5,051,668	593,335	10,966,629	70.21	4,652,657	810,160	3,838,251	323,010
Gulf, Mobile & Northern	402	1,735,169	297,628	2,142,442	281,561	361,744	45,729	653,675	96,595	1,439,372	67.18	703,071	111,060	592,002	81,538
Hocking Valley	349	8,363,228	874,584	9,948,828	856,211	2,149,633	104,951	3,360,198	233,314	6,703,741	67.38	3,245,087	799,000	2,439,368	521,581
Houston & Texas Central	948	5,178,394	1,617,639	7,315,539	944,706	840,545	192,054	2,324,669	211,043	4,533,334	61.97	2,782,204	493,534	2,282,017	210,878
Houston East & West Texas	190	1,186,557	380,374	1,675,621	218,362	172,156	54,381	548,116	35,769	1,002,855	59.85	672,166	148,364	522,620	37,681
Illinois Central	4,765	58,105,518	15,285,371	79,746,003	10,674,884	16,718,930	1,194,387	26,172,133	1,883,408	56,942,446	71.40	22,803,557	5,253,729	17,538,263	2,590,035
Indiana Harbor Belt	109	.....	.....	4,776,154	554,627	610,628	31,183	2,375,115	111,895	3,683,449	77.12	1,092,705	92,662	999,969	—346,070
International & Great Northern	1,159	7,783,393	2,780,190	11,327,359	1,305,246	1,835,306	249,253	3,141,990	343,125	7,816,197	69.00	3,511,162	334,936	3,173,912	862,354
Kanawha & Michigan	176	2,810,031	376,075	3,306,442	400,109	819,843	36,441	985,089	83,711	2,325,372	70.33	981,070	241,338	739,710	—173,410
Kansas City, Mexico & Orient	272	907,133	137,127	1,101,552	172,870	289,837	57,755	507,432	65,815	1,093,710	99.29	7,842	68,356	—60,766	—98,050
Kansas City, Mexico & Orient of Texas	465	959,270	174,896	1,193,442	208,664	265,291	43,429	614,510	52,398	1,184,292	99.23	9,150	59,602	—50,672	—85,513
Kansas City Southern	755	8,776,376	1,635,516	11,338,664	1,082,659	1,667,716	282,894	3,539,141	369,521	6,913,338	60.97	4,425,325	657,252	3,764,174	501,286
Lake Erie & Western	900	6,525,126	608,081	7,499,910	894,206	1,256,699	149,259	2,962,671	169,213	5,432,048	72.43	2,067,862	336,500	1,730,871	—488,796
Lehigh & Hudson River	96	1,880,658	44,969	2,089,302	209,182	317,689	17,927	740,391	54,958	1,340,146	64.14	749,156	80,400	668,754	—21,726
Lehigh & New England	296	3,265,837	14,383	3,412,530	408,077	507,038	31,719	1,049,923	98,496	2,095,014	61.39	1,317,515	197,760	1,119,755	102,158
Lehigh Valley	1,444	41,219,779	4,441,343	49,495,607	5,391,610	8,948,357	908,474	21,775,693	1,039,230	38,222,461	77.22	11,273,146	2,030,535	9,240,411	—2,410,240
Long Island	397	4,268,399	9,817,644	15,959,656	1,697,390	1,782,994	137,515	6,627,764	406,302	10,732,950	67.25	5,226,706	865,861	4,359,304	407,342
Los Angeles & Salt Lake	1,158	7,485,753	3,179,874	11,632,863	1,265,231	1,647,140	362,518	3,348,701	256,929	7,070,813	60.78	4,562,050	678,892	3,882,672	—30,027
Louisiana & Arkansas	302	1,123,253	247,222	1,426,928	255,848	238,973	42,052	433,922	48,476	1,016,149	71.21	410,779	109,351	301,374	—45,368
Louisiana Ry. & Nav. Co	342	1,716,992	399,998	2,246,001	287,914	296,687	71,084	855,275	72,995	1,583,955	70.52	662,046	192,449	469,094	3,616
Louisiana Western	207	2,240,600	821,301	3,299,470	250,096	375,735	85,804	721,509	85,879	1,539,939	46.67	1,759,531	381,404	1,376,745	492,195
Louisville & Nashville	5,070	51,147,627	14,510,941	70,040,802	8,502,836	13,511,381	1,408,890	23,134,723	1,435,039	48,105,638	68.68	21,935,164	4,384,135	17,539,871	—833,645
Louisville, Henderson & St. Louis	199	1,479,924	450,865	2,034,737	260,449	257,941	55,287	679,944	39,416	1,293,038	63.55	741,699	76,300	664,837	189,730
Maine Central	1,216	8,301,678	3,563,706	13,000,393	1,494,022	1,870,034	136,459	5,814,148	319,474	9,676,114	74.43	3,324,280	656,040	2,667,932	—579,941
Michigan Central	1,861	30,979,076	11,617,786	48,152,039	5,474,763	7,219,114	782,570	20,172,138	876,537	35,760,525	73.23	12,891,515	1,864,000	11,014,700	—1,919,479
Midland Valley	381	2,007,789	557,695	2,670,125	553,401	344,318	32,967	815,913	92,889	1,839,488	69.89	830,637	73,077	757,282	253,406
Mineral Range	120	1,034,546	32,670	1,097,456	223,266	202,181	5,220	590,055	13,364	1,034,085	94.23	63,371	34,277	29,094	—119,099
Minneapolis & St. Louis	1,646	7,536,265	1,773,859	9,971,366	1,539,056	1,142,871	196,690	4,137,444	250,748	7,266,160	72.87	2,705,206	494,819	2,207,591	—689,173
Minn., St. Paul & Sault Ste. Marie	4,227	23,511,220	6,013,771	31,960,406	3,487,999	4,386,527	522,995	11,731,507	710,595	20,944,423	65.53	11,015,983	1,408,469	9,605,145	—3,435,942
Missouri & North Arkansas	365	802,505	413,557	1,308,359	224,928	214,047	43,467	494,826	59,456	1,031,923	78.87	276,436	61,481	213,122	26,289
Missouri, Kansas & Texas Lines	3,868	26,491,951	9,801,749	39,125,389	5,891,389	7,886,258	723,343	13,984,004	1,160,505	29,942,280	76.53	9,183,109	1,780,376	7,392,859	2,446,765
Missouri, Oklahoma & Gulf	332	1,376,785	278,646	1,761,689	218,170	305,141	45,415	763,714	80,972	1,415,031	80.32	346,658	100,571	245,235	207,352
Missouri, Okla. & Gulf of Texas	77	233,284	4,932	241,315	23,731	21,557	16,444	77,767	14,730	154,255	63.92	87,061	2,020	85,027	60,750
Missouri Pacific	7,301	29,473,259	7,961,101	40,413,097	5,616,208	6,221,685	823,908	13,329,658	885,119	26,977,975	66.76	13,435,121	2,134,500	11,293,653	.....
Mobile & Ohio	1,160	10,452,848	1,417,069	12,557,154	1,363,082	3,017,136	414,928	4,356,687	351,420	9,512,890	75.76	3,044,263	586,735	2,454,781	—80,836
Monongahela	108	1,777,128	161,076	1,981,559	406,551	185,469	10,096	577,252	45,824	1,225,192	61.83	756,367	49,000	707,165	—179,413
Monongahela Connecting	5	.....	.....	1,710,105	332,123	286,834	3,869	879,083	47,115	1,549,025	90.58	161,080	21,549	139,530	72,488
Morgan's La. & Tex. R. R. & S. S. Co.	401	4,506,041	1,305,734	6,204,164	642,924	808,837	131,195	1,776,450	145,439	3,529,199	56.88	2,674,965	447,365	2,223,854	1,084,865
Nashville, Chattanooga & St. Louis	1,236	9,581,822	3,154,745	13,840,863	1,441,118	2,632,126	603,430	5,279,924	394,681	10,476,955	75.70	3,369,909	540,000	2,821,096	—274,341
Nevada Northern	165	2,051,145	167,889	2,276,560	228,449	234,394	9,061	424,079	62,560	959,636	42.15	1,316,924	114,787	1,202,136	105,103
New Orleans & North Eastern	204	3,193,626	849,311	4,457,360	448,069	827,990	112,668	1,502,177	120,778	3,054,471	68.53	1,402,889	345,046	1,056,665	—9,412
New Orleans Great Northern	285	1,328,682	338,567	1,750,535	179,307	283,539	34,736	544,182	73,931	1,118,300	63.88	632,235	85,679	545,970	—137,188
New Orleans, Texas & Mexico	191	1,027,545	258,580	1,331,180	194,695	205,256	49,600	371,825	70,470	891,847	67.00	439,333	20,607	418,480	279,138

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS CALENDAR YEAR 1917—(Continued)

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
New York Central	6,082	$137,074,599	$52,377,014	$219,740,943	$24,150,737	$38,880,831	$2,926,791	$85,873,440	$4,943,923	$159,891,821	72.76	$59,849,122	$10,855,458	$48,970,729	—$15,743,851
New York, Chicago & St. Louis	571	13,599,319	1,310,675	15,607,415	1,317,410	2,441,231	518,196	7,437,162	386,107	12,149,523	77.84	3,457,892	570,000	2,887,665	—210,966
New York, New Haven & Hartford	1,997	37,500,911	31,332,714	78,823,276	8,192,296	11,018,917	427,690	33,024,514	2,234,268	56,190,035	71.29	22,633,241	3,030,000	19,597,426	—1,665,252
New York, Ontario & Western	568	5,490,810	1,637,551	8,476,630	941,365	1,436,723	103,045	3,379,571	217,453	6,078,158	71.70	2,398,473	280,900	2,117,129	—71,378
New York, Philadelphia & Norfolk	112	3,957,506	699,909	5,085,342	437,634	938,898	56,242	2,060,185	120,042	3,681,991	73.40	1,403,351	249,691	1,153,169	—340,000
New York, Susquehanna & Western	135	2,353,304	544,120	3,236,656	300,856	371,696	24,640	1,727,052	62,998	2,485,743	76.80	750,912	150,638	599,650	—136,365
Norfolk & Western	2,086	52,067,967	6,249,214	60,555,477	5,713,266	11,122,873	738,280	18,812,479	1,100,266	37,561,545	62.03	22,993,933	4,622,000	18,370,311	—3,389,613
Norfolk Southern	907	3,453,200	1,127,147	4,883,652	599,615	713,243	89,343	1,757,985	217,175	3,378,543	69.18	1,505,108	180,120	1,324,139	—44,026
Northern Pacific	6,533	59,960,957	14,285,866	80,856,976	10,602,878	9,679,101	1,125,953	25,728,551	1,480,275	48,450,516	59.92	32,406,461	6,388,692	26,008,945	—2,277,619
Northwestern Pacific	507	2,159,050	1,813,062	4,465,379	612,351	510,098	59,130	1,535,774	114,678	2,840,898	63.62	1,624,481	222,014	1,402,318	12,822
Oahu Railway & Land Co	114	970,613	303,572	1,377,715	146,604	100,752	9,543	369,618	61,613	687,008	49.87	690,707	91,138	599,569	38,606
Oregon Short Line	2,306	20,687,370	5,287,409	28,149,723	2,885,887	3,021,453	391,340	7,402,648	856,183	15,026,436	53.38	13,123,287	2,455,412	10,665,121	—343,673
Oregon-Washington R. R. & Nav. Co	2,070	13,711,057	4,905,676	20,244,214	2,919,934	2,182,620	510,112	6,706,113	871,618	13,413,915	66.26	6,830,299	1,265,472	5,563,959	1,160,631
Panhandle & Santa Fe	709	5,058,182	1,026,695	6,353,065	777,141	1,061,414	53,058	1,743,590	141,594	3,751,306	59.05	2,601,759	747,831	1,852,963	312,901
Pennsylvania Company	1,754	52,354,190	12,550,860	72,846,146	8,847,734	13,396,104	1,008,894	31,439,845	1,730,363	56,928,711	78.15	15,917,434	4,150,292	11,762,119	—7,800,490
Pennsylvania Railroad	4,562	164,840,887	47,942,228	235,957,616	28,160,143	47,476,292	2,569,601	95,337,110	5,864,366	183,147,523	78.62	52,810,093	9,456,689	43,312,287	—8,410,801
Peoria & Pekin Union	19	157,889	62,395	1,112,473	120,119	166,743	413	666,706	.....	989,521	88.95	122,952	92,000	30,951	—113,697
Pere Marquette	2,246	11,623,127	2,948,354	16,253,493	1,884,888	2,139,641	307,382	6,346,275	433,088	11,143,137	68.56	5,110,356	484,365	4,625,964	92,559
Philadelphia & Reading	1,127	50,717,789	7,133,174	61,712,552	3,919,399	11,247,848	536,965	25,542,258	1,010,497	42,391,261	69.69	19,321,291	1,710,231	17,610,001	—4,694,670
Philadelphia, Baltimore & Washington	717	14,840,951	12,465,286	30,039,055	3,554,225	5,557,360	344,730	12,341,442	646,189	22,420,728	74.64	7,618,927	970,117	6,648,365	1,050,375
Pittsburgh & Lake Erie	224	19,565,612	2,141,496	23,681,336	2,677,337	4,396,609	177,446	7,379,646	404,740	15,092,416	64.73	8,588,920	1,300,400	7,288,520	—3,356,409
Pittsburgh & West Virginia	63	997,896	82,729	1,162,465	138,510	176,716	15,806	350,004	51,109	762,376	65.68	400,089	77,244	322,845	.....
Pittsburgh, Cincinnati, Chic. & St. L	2,398	47,648,680	12,649,196	67,667,403	7,429,166	13,510,306	1,182,222	26,953,717	1,585,653	51,192,382	75.65	16,475,021	2,903,715	13,569,786	—137,581
Pittsburgh, Shawmut & Northern	204	1,048,010	61,079	1,141,805	198,880	510,684	14,383	523,362	56,457	1,303,766	115.18	—161,961	19,747	—181,709	—434,610
Port Reading	21	1,550,432	.....	1,832,571	140,312	114,791	436	948,832	9,322	1,213,043	66.19	619,528	114,500	505,028	—67,929
Richmond, Fredericksburg & Potomac	87	2,176,878	1,745,245	4,451,580	322,700	499,153	41,840	1,554,101	95,441	2,560,450	57.52	1,891,129	340,477	1,550,499	123,455
Rutland	415	2,222,616	1,171,253	3,999,774	483,566	635,475	113,633	1,657,528	90,462	2,994,055	75.86	1,005,719	221,387	784,173	—225,166
St. Joseph & Grand Island	257	1,711,163	291,512	2,146,121	960,495	278,266	38,653	794,859	61,358	2,151,993	100.27	—5,872	97,127	—103,245	—664,584
St. Louis, Brownsville & Mexico	548	2,038,023	1,145,271	3,525,583	533,869	435,993	115,373	992,872	119,876	2,174,899	61.69	1,350,693	105,000	1,244,586	—120,049
St. Louis Merchants Bridge Terminal	9	.....	8,090	2,917,552	361,610	183,455	10,245	1,476,770	84,344	2,116,424	72.54	801,128	90,564	710,524	83,356
St. Louis-San Francisco	4,752	34,948,868	13,822,408	52,357,863	5,912,506	8,608,626	718,047	17,538,017	1,408,335	33,967,006	65.87	18,390,857	2,184,531	16,193,013	†
St. Louis, San Francisco & Texas	143	715,529	235,631	1,042,293	176,397	178,473	23,538	491,066	60,892	930,365	89.26	111,927	18,070	93,814	9,809
St. Louis Southwestern	1,754	11,804,974	2,923,658	15,606,489	1,687,891	2,691,304	514,778	4,511,139	.....	532,852	63.14	5,652,206	931,072	4,719,893	1,321,978
San Antonio & Aransas Pass	732	2,541,181	925,695	3,740,962	653,692	607,426	79,221	1,710,206	155,526	3,199,305	85.52	541,657	163,483	377,049	—93,129
Seaboard	3,461	18,038,768	6,857,509	27,507,652	3,026,657	4,579,475	848,333	10,170,647	737,335	19,552,444	71.08	7,955,208	1,247,460	6,697,948	42,350
Southern	6,982	53,873,054	21,289,903	82,317,062	9,132,132	13,259,743	1,841,144	28,645,186	1,995,690	55,084,217	66.92	27,232,845	3,734,311	23,471,902	2,721,310
Southern in Mississippi	278	689,525	361,249	1,155,215	238,756	98,830	24,972	492,852	46,288	901,699	78.05	253,516	108,300	144,995	12,507
Southern Pacific	7,102	87,986,509	30,294,684	129,358,877	11,225,540	16,458,046	1,930,593	46,576,221	2,970,105	80,871,895	62.52	48,486,983	9,173,696	39,281,295	2,592,924
Spokane, Portland & Seattle	554	4,212,590	1,552,009	6,212,946	694,495	492,119	87,810	1,515,011	151,449	2,988,697	48.10	3,224,249	639,590	2,583,978	932,934
Staten Island Rapid Transit Co	23	617,255	645,630	1,388,177	196,889	153,393	12,142	666,489	56,664	1,085,379	78.19	302,798	91,000	211,690	—121,539
Tennessee Central	292	1,166,488	381,042	1,655,360	256,010	263,574	53,337	607,085	77,774	1,257,700	76.98	397,660	52,800	344,823	—3,190
Terminal Association of St. Louis	3b	.....	16,108	3,462,238	474,171	248,478	10,837	1,090,109	64,443	1,910,484	55.18	1,551,754	400,990	1,150,728	—250,797
Texarkana & Ft. Smith	81	800,619	133,394	1,021,596	89,848	53,611	30,924	318,444	39,791	527,661	51.75	493,929	81,351	411,919	86,978
Texas & New Orleans	468	4,025,930	1,299,758	5,819,756	521,180	864,934	96,949	1,768,255	125,269	3,539,598	61.82	2,280,158	466,086	1,810,355	779,608
Texas & Pacific	1,946	13,371,241	5,525,381	20,272,236	2,046,455	2,709,385	437,994	8,090,349	655,228	14,056,369	69.34	6,215,867	1,105,000	5,102,358	218,241
Toledo & Ohio Central	435	6,403,006	623,827	7,504,984	941,548	1,343,233	93,026	3,035,547	118,986	5,553,089	73.99	1,951,895	347,505	1,604,307	380,980
Toledo, Peoria & Western	247	701,670	389,006	1,181,951	201,221	321,576	26,277	473,501	52,807	1,075,086	90.96	106,865	85,002	21,864	—61,812
Toledo, St. Louis & Western	455	5,815,616	406,685	6,525,551	988,319	1,008,455	204,951	2,260,799	107,715	4,566,918	69.99	1,958,633	273,200	1,684,595	—54,926
Trinity & Brazos Valley	365	716,872	156,327	976,529	267,730	352,036	27,517	445,078	83,152	1,175,513	120.38	—198,985	61,020	—260,025	—87,449
Ulster & Delaware	128	462,783	284,788	944,873	87,403	121,330	18,357	450,221	47,148	728,166	77.06	216,707	48,000	169,007	—45,714
Union Pacific	3,622	50,771,521	12,595,168	69,906,404	8,256,534	9,030,926	1,247,163	20,047,540	1,976,712	41,512,611	59.38	28,893,793	4,931,488	23,459,142	—3,121,770
Union R. R. of Baltimore	8	1,397,097	425,022	1,846,455	94,801	.....	.....	86,472	23,388	204,652	11.08	1,641,803	563,027	1,078,776	—419,364
Union R. R. of Penna	35	.....	.....	5,370,796	436,205	1,813,769	3,321	2,832,080	73,090	5,157,493	97.03	213,303	98,248	115,055	—1,378,286
Vicksburg, Shreveport & Pacific	171	1,210,523	553,095	1,980,865	208,522	334,542	56,781	603,187	62,841	1,283,992	65.82	696,873	161,016	535,360	140,299
Virginian	512	8,454,692	507,047	9,532,240	734,248	1,453,249	65,535	2,591,328	172,794	5,190,914	54.46	4,341,327	509,000	3,832,300	283,160
Wabash	2,519	27,067,805	6,947,733	37,189,669	3,631,917	4,989,976	961,264	15,289,653	841,215	25,891,734	69.62	11,297,936	1,297,970	9,995,033	—657,932
Washington Southern	35	728,062	1,090,454	2,327,464	148,977	234,912	16,129	741,421	42,191	1,203,783	51.72	1,123,681	156,544	967,112	306,656
West Jersey & Seashore	359	2,532,428	4,844,722	8,008,470	1,373,602	1,194,023	124,471	3,463,935	193,515	6,399,164	79.90	1,609,306	462,323	1,146,715	—321,668
Western Maryland	697	10,527,599	1,001,968	12,361,567	1,359,625	2,405,877	252,192	4,284,999	316,079	8,757,557	70.95	3,604,011	439,000	3,165,011	—563,288
Western Pacific	974	7,254,568	1,350,830	9,019,647	1,451,982	904,934	232,079	2,703,029	252,372	5,634,920	62.47	3,384,727	446,603	2,937,933	255,814
Western Railway of Alabama	133	881,460	508,071	1,538,559	187,223	300,394	70,437	491,028	51,223	1,124,799	73.11	413,760	92,141	321,591	40,133
Wheeling & Lake Erie	512	8,805,547	583,880	10,285,125	1,287,624	1,647,204	104,214	3,564,771	224,313	6,848,249	66.58	3,436,876	544,987	3,891,880	—234,067
Yazoo & Mississippi Valley	1,381	12,364,716	3,094,920	16,342,070	2,737,815	2,705,825	240,307	5,274,369	408,999	11,309,613	69.21	5,032,458	1,188,852	3,840,911	—372,299

†Began operation November 1, 1916.

The Winter Is Half Through

F. D. Underwood, president of the Erie Railroad Company, last week issued an appeal to officers and employees, in which he said:

"Weather and other conditions on the Erie Railroad have resulted in conditions that inflict hardships on officers and employees of every grade. By comparison, however, the hardest lot of any man on the railroad is light compared with that of your fellows in the army abroad. We are less than manly when we grumble at conditions here. Let us anew apply ourselves to the work before us, regardless of any personal discomfort. The winter is half through. Do not lie down for a minute. Conditions must be better in a short time.

"Especially guard against the error that has found voice that, now that the Government has taken over the railroads, a lesser effort on the part of employees will go. The direction of railroads remains in the hands of its officers, and they have the right to demand from every loyal employee full support. Your responsibilities to them and to the Erie Railroad are in no way lessened.

"If we allow the work to lag we are not only unworthy American citizens, but are doing a direct injury to our brothers abroad. * * *"

Inductive Interference by Parallel Power Circuits

This is a subject on which very little exact data is available, but which is of considerable importance to men who have to lay out power circuits which parallel communication circuits, and conversely to men who have to lay out communication circuits which parallel power circuits.

Since December, 1912, the California Railroad Commission, through the joint committee on Inductive Interference, has carried on an exhaustive investigation of the problem of inductive interference to communication circuits by parallel power circuits; and after five years' work the joint committee has completed its task at a cost of over $100,000, this expenditure having been borne jointly by the commission and the interested power and communication utilities. The subject is of particular interest to the signal, telephone and telegraph departments of railways. There have been many requests for copies of the report, and the commission is considering the publication in book form of the most important data. It will go ahead with the work if a sufficient number of subscriptions can be obtained in advance to warrant the necessary outlay. Information can be obtained from Richard Sachse, chief engineer, California Railroad Commission, 833 Market street, San Francisco, Cal.

Railway Business Association

The dinner of the Railway Business Association, which was to have been held on January 25, and the postponement of which has already been announced, has been definitely cancelled by the General Executive Committee and subscriptions have been refunded. It was decided to hold a business convention, without public dinner, on a date yet to be fixed.

Engineering Institute of Canada

This is now the name of the former Canadian Society of Civil Engineers, the change having been made at the annual meeting in Montreal, January 24. The president for the ensuing year is **H. H. Vaughan**, vice president and managing director of the Dominion Bridge Company.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings of those associations which will meet during the next three months.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next annual meeting, March 20-22, 1918, Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 149 Peoples Gas Bldg., Chicago. Annual exhibition, March 18-21, 1918, Coliseum and Annex, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, March 18, Chicago.

Traffic News

J. A. Middleton, formerly freight traffic manager of the Missouri Pacific, has been appointed in charge of the oil traffic of the United States Food Administration.

The enlarged Erie Canal is expected to be open for traffic from Lake Erie to the Hudson river on May 15, next. **Frank M. Williams,** state engineer of New York, in his annual report, says that it is urgently necessary that the government take action looking to the construction of barges for use on the canal. A large amount of work still remains to be done on the canal in the vicinity of Rochester.

To induce farm settlement in the Dakotas and Montana and thereby increase agricultural production next season, the St. Paul will make low homeseekers' rates to those states, beginning in March and continuing until November. These fares will be in effect every Tuesday. In past years the homeseekers' rates have been in effect only on the first and third Tuesdays of each month, and last year did not become effective before May.

The Interstate Commerce Commission Wednesday announced its decision in the Transcontinental Commodity Rate cases, allowing increases in rates to Pacific Coast terminals. Because of the temporary absence of water competition the order issued is substitute for the order of June 30 last year, which was suspended pending investigation of tariffs filed by railroads, which are now approved in some particulars, but ordered modified in others.

The volume of parcel post business in the month of December was greater than in the same month of 1916 by 1,173,000 sacks. The Post Office Department reports that in order to relieve the railroads, parcels are being sent from New York to Norfolk, Va., by steamer. The time is 19½ hours, but, it is said, this time, under present conditions, is faster than by railroad. Throughout the United States the parcel post traffic has been greatly increased because of delays to freight by embargoes and by adverse weather conditions.

The Pennsylvania Railroad reports that the reductions in passenger train service put into effect on its lines on January 6,—104 trains week days and 51 on Sundays—amount to an aggregate of 2,708,212 train miles annually. The number of enginemen thus released equals 55 men each day, and of firemen the same; and a corresponding number of conductors and brakemen. Of the 29 locomotives released, only a part are available for use in the freight service as some of the company's passenger engines were urgently in need of repairs. Thirty-five lines of parlor and sleeping cars were discontinued.

In an article in this column on January 18 regarding the discontinuance of freight solicitation, it was stated that the Texas & Pacific, the International & Great Northern and the St. Louis Southwestern closed their traffic offices in Chicago. As a matter of fact, these roads did not close their offices but merely discontinued solicitation for a short time. Their agents are again "doing business as usual." The Buffalo, Rochester & Pittsburgh announces that its freight agencies at Cincinnati, Ohio, and Detroit, Mich., have been closed. The Missouri & North Arkansas has closed its traffic offices at Joplin, Mo., Helena, Ark., and Wichita, Kan., New Orleans, La., and Chicago.

An Appeal to Work on Mondays

In order to encourage the loading and unloading of freight cars in the Chicago terminal district on the coalless holidays the following advertisement was published in Chicago newspapers on January 27:

"Shippers and receivers of freight in the Chicago district and adjacent towns can assist railroad transportation by using every man who can be employed to unload and free freight cars on next Monday and on following Monday holidays. This in accordance with the wishes of the Fuel Administration. If these

cars are emptied and moved out of Chicago district, transportation generally will be facilitated."

Eleven Per Cent of Cars Saved

W. P. Trickett, of the Minneapolis (Minn.) Traffic Association, reports that in the 12 months ending with December, 558,481 tons of merchandise were forwarded from Minneapolis, as compared with 545,036 tons in 1916, or an increase of more than 13,000 tons; yet it took 11 per cent less cars; but 92,891 cars in 1917 compared with 104,519 in 1916.

Large shippers in the Chicago terminal district have sent an inquiry to the Fuel Administration at Washington asking whether they will be permitted to use sufficient coal on the remaining fireless Mondays to operate mechanical loading and unloading facilities, such as derricks and cranes. According to a recent official interpretation of the new demurrage rules, demurrage charges will accrue on these coalless holidays just as on any other weekdays, and the Fuel Administration order does not forbid anybody to load or unload cars. The complaint of the Chicago shippers is that unless they are permitted to use mechanical facilities for loading or unloading cars on the coalless days, the release of cars at their plants will be delayed, and severe financial loss will be suffered because of the demurrage accruing during that time.

Coal Situation at New York and Boston

The movement of coal to New York City continues about 25,000 tons or less daily, when the normal needs of the city at this time of the year are estimated at 40,000 tons a day. The County Fuel Administrator says that hundreds of apartment houses are complaining that they are utterly without coal; and over 100 schoolhouses are closed for lack of heat. On fireless Monday, this week, it was estimated that the consumption of anthracite in the city was 15,000 tons less than usual, but the saving is likely to be obliterated by the difficulties developed by the severe storm in Pennsylvania on Sunday and Monday, which will delay shipments seriously for the remainder of this week. The number of ships waiting at New York to be coaled has been reduced to 29, and it appears that in this respect the coal-traffic pressure has been relieved. The Baltimore & Ohio has just put in operation a new coal dumper, at its Staten Island terminal.

The Boston Fuel Committee on Tuesday, January 29, ordered the dealers to deliver no coal to office buildings in that city for 48 hours; and the same rule will apply to factories and stores to a large extent. Coal going to Boston and other New England points by water has been seriously delayed by ice and storms.

Big Four Takes Off Many Trains

The Cleveland, Cincinnati, Chicago & St. Louis on January 13 discontinued passenger train service to the extent of 110,212 miles per month, or 17.25 per cent of the mileage in operation prior to that date. The principal changes are as follows: The Royal Palm Limited has been discontinued in both directions between Chicago and Cincinnati, and the road has gone out of the Florida passenger business entirely. One train has been taken off in each direction between Cincinnati, Ohio, and Detroit, Mich., and the express trains operating in each direction between Bellefontaine, Ohio, and Toledo, have been consolidated, thereby reducing the service between those points by four trains. Trains Nos. 26 and 35 between Cleveland and Cincinnati have been taken off and one train in each direction on the Indianapolis division has been discontinued. In addition, parlor car and sleeping car service has been abandoned between Louisville, Ky., and Chicago. These reductions in passenger service have made 16 Atlantic type locomotives and five smaller passenger engines available for moving freight and troop trains.

The St. Louis-San Francisco has discontinued nine Sunday local trains out of St. Louis. The trains taken off include three between Pacific, Mo., and St. Louis; two between Cuba, Mo., and St. Louis; two between St. Marys and St. Louis, and two between Valley Park and St. Louis. The Wheeling & Lake Erie suspended all passenger traffic on Sunday, January 27, in order to release locomotives for the movement of coal; and similar action will be taken on succeeding Sundays, if conditions warrant it.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has approved the filing of tariffs providing for an increase in demurrage charges on lighters and barges at points in New York harbor.

State Commissions

The Corporation Commission of Oklahoma has directed the general adoption of a new tariff, with high rates, for storage of freight left in the hands of the carrier more than 12 days after arrival at destination. After 48 hours the charge will be 5 cents a ton; and this rate will be increased 5 cents each day until it reaches 50 cents a ton.

Personnel of Commissions

Joseph W. Folk, former governor of Missouri, has resigned his place as counsel to the Interstate Commerce Commission, and has been appointed counsel for the St. Louis Chamber of Commerce.

Court News

Agency for Consignee

The Kentucky Court of Appeals holds that the rule that the carrier of goods, upon receiving them for shipment, becomes the agent of the consignee, has no application where the consignee or its agent assumes or takes control of the goods at the point of destination, and there exercises such control in delivering the goods to purchasers.—Celli v. Commonwealth, (Ky.) 199 S. W. 1. Decided December 18, 1917.

Delivery by Connecting Lines

The Texas Court of Civil Appeals holds that under the state statute requiring connecting carriers to forward goods within a reasonable time and authorizing the railroad commission to fix such time, a railroad transferring goods within the time fixed by the commission is not liable, although it might reasonably have done so sooner.—Quanah, Acme & Pacific v. Bone (Tex.) 199 S. W. 333. Decided November 28, 1917.

Failure to Furnish Tools

The Iowa Supreme Court holds that a railroad company is not guilty of negligence in failing to furnish section men grappling hooks to move ties 12 feet long and 8 or 9 inches square which weighed about 150 lb., where it appeared that the four men moving and piling the ties could do so without such tools. Nor was the company bound to warn or instruct its section men as to their duty in moving and piling the ties. A servant assumes the risk of injury from strains in lifting heavy weights, it being assumed that he should be the best judge of his own lifting capacity.—Rook v. Davenport, R. I. & N. W. (Iowa) 165 N. W. 419. Decided December 18, 1917.

Assessment of Benefits

In an assessment case the trial court said, in substance, that the effect of drainage such as was involved in the controversy was to increase the productiveness of the soil in the country tributary to the railroad, and tend to increase its business, and that this was a material fact to be considered in the assessment of benefits. Of this language the railroad complained on appeal. The Iowa Supreme Court holds that while all the benefits resulting to a railroad company's property within a drainage district from the drainage improve-

ments must necessarily be considered in making the assessment, other benefits resulting to the company or its property because of the improved conditions of land adjacent to the district or because of any other resulting advantages which it enjoys in common with the general public are too remote and intangible to be made a basis of levying assessments.—C. & N. W. v. Board of Supervisors (Iowa) 165 N. W. 390. Decided December 18, 1917.

Switchman's Assumption of Risk at Curves

A foreman switchman sued for injuries received while moving a car on a spur track. The track ran alongside a coal bin and was some four feet away from it, though at one point there was a 30-degree curve, where the middle part of the car swung much closer to it. The plaintiff was standing at such a spot that, in spite of the efforts of the trainmen when they saw his danger, he was caught between the car and the bin. The Missouri Supreme Court held that as there was nothing in the evidence to indicate that the railroad did not do its best consistently with successful operation in the location and construction of the spur track in question, it would be presumed that it did. A railroad is not required so to construct a track in relation to the physical features of the industry served that switching would be absolutely safe even to careless employees. A switchman of 19 years' experience would be held to know that, in a case like this, the body of a car moves towards the inside of a curve. The plaintiff was held negligent in assuming the position of danger and unnecessarily remaining after his reason for taking it had ceased; he owed the railroad the duty to suggest a change in the track if one was necessary, and if he did not he assumed the risk.—Morris v. Pryor (Mo.), 198 S. W., 817. Decided November 17, 1917. Rehearing denied December 1, 1917.

Contracts as to Fencing and Cattle Guards

The deed of a right of way to a railroad provided that the grantor should erect and maintain all necessary fencing and the railroad should make proper crossings and cow gaps. Under the Kentucky statute the landowner would have had to construct and maintain the fence on one-half of the division line, and cattle guards were required to be maintained by the railroad company "at all terminal points of fences constructed along the lines," except that where there was a private passage across the right of way, the landowner should bear one-half of the expense. The Kentucky Court of Appeals holds that the fencing required to be constructed under the contract was such as both parties would have been required to construct and maintain by statute, except for the contract, and the cattle guards which the railroad obligated itself to maintain were such as the statute put on it the duty to provide. The company was under no duty to construct or maintain cattle guards until the landowner had constructed a fence on each side of the right of way. The construction and maintenance of fences and cattle guards went together.—Louisville & Nashville v. Durbin (Ky.), 198 S. W., 908. Decided December 11, 1917.

Validity of Leases by Railroads

A lease from a railroad company of a portion of land to be used for storing ties provided as part of the consideration that the lessee released all claim for damages on account of fire caused by the operation of the railroad on or near the premises, whether the damage occurred on the premises leased or on premises adjacent thereto. A spark from a locomotive on a spur track closely adjacent to the track extending into the leased land set fire to and destroyed certain ties. The Illinois Supreme Court holds that the lease was not invalid as against public policy; the use of the land leased for storage purposes not being a public utility. A "public utility" must be such a use as is common and has the same terms, however few the number who avail themselves of it, though it may be limited to the inhabitants of a small locality. And the act of a railroad company in leasing land used as part of its right of way cannot be attacked as ultra vires on the ground that the land cannot be held by it for such purpose by any party except the state, whether the real estate has been acquired for the authorized uses or not. Judgment for defendant was affirmed.—Bartee Tie Co. v. Jackson (C. & E. I.) 117 N. E. 1007. Decided December 19, 1917.

Carrying State Officers Free

In an action involving consideration of the constitutionality of a New Jersey statute of 1915, requiring railroad companies to carry certain state officers and employees free, the New Jersey Court of Errors and Appeals holds that even though the state, in the railroad's charter reserved the right to amend, alter, or repeal the charter, it cannot by virtue of such right impose on the railroad company the burden of carrying free of charge state officers; for that works a deprivation of the railroad's property without due process of law.—Napier v. D. L. & W. (N. J.) 102 Atl. 444. Decided November 19, 1917.

Warning of Low Bridge

In an action for the death of a freight brakeman, there was evidence to show that he was found dead on the coal heap of the engine, and it was alleged his head had been crushed by an overhead bridge, five of which the train had passed under. The first four bridges were eliminated on account of their height, and it was a question for the jury whether the last bridge struck the deceased. It appeared that the middle span of the last bridge was considerably lower than the two side spans, and because of its blackened condition, that fact could not be seen until an observer was very close. It was held that an instruction that if the brakeman was struck and killed by the bridge, then the question for determination was whether he was warned by the company of his danger, and that the warning did not have to be in writing, or any formal warning by this or that officer, it being sufficient if he was given all the knowledge that the company could give him, properly submitted the question of warning to the jury. It was also held that though the company had provided telltales, it could not as a matter of law be declared that such safeguards were in themselves sufficient notice and warning.—Marland v. P. & R. 246 Fed., 91. Decided November 7, 1917.

Reparation for Unreasonable Freight Rates

In consolidated actions by a shipper of live stock against several railroads to recover from each of them the amount awarded the plaintiff by an order of reparation made by the Interstate Commerce Commission awarding damages for exaction of unreasonable freight rates, the Circuit Court of Appeals, Eighth Circuit, in reversing a judgment for the plaintiff in the Federal District Court for the Western District of Missouri, made the following rulings:

While the commission in making investigations should not be too narrowly constrained by the technical rules as to the admissibility of proof, nor hampered by those narrow rules which prevail in trials at common law, yet, by reason of the liberality of practice in admitting testimony, it is more imperative to preserve the essential rules of evidence by which rights are asserted or defended, and the commissions cannot act on their own information, but the parties must be fully apprised of the evidence submitted and be given an opportunity to cross-examine witnesses, inspect documents, and offer evidence in explanation. Administrative orders, quasi judicial in character, are void if hearing was denied, if that granted was inadequate or manifestly unfair; if the finding was contrary to the indisputable character of the evidence or if the facts do not support the order. An order of the commission based on a finding unsupported by evidence is contrary to law and must be set aside by a court of competent jurisdiction. An order of reparation, awarding damages for unreasonable rates, requires a finding disclosing the relation of the parties as shipper and carrier, the character and amount of traffic out of which the claims arose, the rates paid, whether they were unreasonable, and whether the shipper was injured, and if so the amount of his damage. Testimony that the witness had obtained from commission houses to which cattle had been consigned and from individuals not shown to be the owners of cattle is the worst kind of hearsay.

Under section 15, it is held improper for the commission, having ordered reduced rates for a period of two years, to order reparation solely on account of the previous exaction of higher

rates during a previous period of two years, for the grant of reparation, being based entirely on the difference in rates, was tantamount to the establishment of a rate for over four years, and without giving notice as to when it should go into effect. Where a rate subsequently condemned by the commission as unreasonable was, when exacted, a legal rate, the shipper could not sue in a court of law and recover back any portion of such rate. The reparation order was therefore declared by the court to be improper.

Where unreasonable rates were exacted for the transportation of cattle to markets, the difference between the unreasonable rates exacted and reasonable rates subsequently established cannot be made the only basis for a reparation order for damages under section 16 of the act. There was no showing that the shippers were actually damaged from the exaction of such rates.—A. T. & S. F. v. Spiller, 246 Fed., 1. Decided October 26, 1917.

Discrimination in Laying Side Tracks

Conceding that a contract with a logging company, by which a railroad used the track of the logging company on condition that it should haul no pine logs for any rival was void as to the condition, the Alabama Supreme Court holds that the contract afforded no basis for requiring the carrier to haul pine logs for another person, since, if the contract were void, the carrier had no rights whatever, and could not enter and use the rails, and if it were valid it could not be interfered with. A carrier, owning or leasing a line of road, may be compelled by the Public Service Commission to give equal facilities to all persons of the same class, and cannot by contract with some customers exempt itself from treating all alike. And if a common carrier, having a mere license to use the rails of a logging company, has by its contract agreed not to give equal service to competitors of the logging company, it cannot be compelled to do so, though the contract is void, the Public Service Commission not being empowered to make a new contract for the parties. The commission had no power to compel the railroad to lay a side track to serve a competitor of the logging company, since such an order would make the railroad a trespasser; nor could the commission legalize the trespass and so exempt the railroad from liability. Alabama Central v. Commission (Ala.) 76 So. 862. Decided November 15, 1917.

United States Supreme Court

Reparation for Excessive Rates

Suit was brought to recover alleged excessive charges on hardwood lumber. The Interstate Commerce Commission had found the rate to be excessive, and had made an order for reduction from 85 to 75 cents, which was obeyed, and also one for reparation to the extent of the excess, which was not obeyed.—13 I. C. C., 668. A demurrer to the declaration was sustained by the Circuit Court on the ground that it was not alleged that the plaintiffs had paid the excessive rates or that they were damaged thereby.—190 Fed., 659. The declaration was amended, but at the trial the judge directed a verdict for the defendants, presumably on the ground that it did not appear that the plaintiffs were damaged. The judgment was reversed by the Circuit Court of Appeals.—221 Fed., 890. 137 C. C. A., 460. At a new trial the jury were instructed that if they found the rate charged unreasonable, and that prescribed by the commission reasonable, they should find for the plaintiffs in accordance with the commission's award. The jury found for the plaintiffs and that judgment was affirmed by the Circuit Court of Appeals.—229 Fed. 1022. 143 C. C. A., 663.

On appeal to the Supreme Court of the United States the only question before the court was whether the fact that the plaintiffs were able to pass on the damage that they sustained in the first instance, collecting that amount from the purchasers, prevented their recovering the overpayment from the carriers. In affirming the judgment for the plaintiffs the court distinguished the cases like Pennsylvania v. International Coal Mining Co., 230 U. S., 184, where a party that has paid only the reasonable rate sues on a discrimination because some other has paid less, where the damage depended on remoter considerations.—Southern Pacific v. Darnel-Taenzer Lumber Co. Decided January 21, 1918.

Equipment and Supplies

Locomotives

THE MISSOURI, KANSAS & TEXAS has ordered 20 freight locomotives from the American Locomotive Company.

THE DELAWARE & HUDSON has ordered 20 Consolidation locomotives from the American Locomotive Company.

THE MAINE CENTRAL has ordered 8 ten-wheel and 4 six-wheel switching locomotives from the American Locomotive Company.

THE MINNEAPOLIS & ST. LOUIS has ordered 15 Mikado and 5 Pacific type locomotives from the American Locomotive Company.

THE LONG ISLAND is reported as ordering four 101-ton eight-wheel switching locomotives from the American Locomotive Company.

THE MIAMI CONSERVANCY DISTRICT, OHIO, has ordered three 48-ton and 10 38-ton four-wheel saddle tank switching locomotives from the American Locomotive Company.

THE HOCKING VALLEY has ordered 20 2-6-6-2 Mallet type locomotives from the American Locomotive Company. The locomotives will weigh 437,000 lb. and will be equipped with superheaters.

THE CHESAPEAKE & OHIO has ordered 15 2-6-6-2 Mallet and 10 ten-wheel switching locomotives from the American Locomotive Company. The Mallet type locomotives will weigh 437,000 lb., the switching locomotives 295,000 lb., and all will be equipped with superheaters.

Freight Cars

G. C. PETERSON & Co., Chicago, are inquiring for 10 to 25 10,000-gal. capacity tank cars.

THE KANSAS CITY STRUCTURAL STEEL COMPANY, Kansas City, Mo., is building 100 10,000-gal. tank cars.

THE MIDCONTINENT TANK CAR COMPANY, Coffeyville, Kan., is inquiring for 12 50-ton, 8,000-gal. capacity tank cars.

E. I. DU PONT DE NEMOURS & Co. have ordered 35 flat, 14 box and 44 shell cars from the American Car & Foundry Company.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, is in the market for 4 to 6 standard gage 10 to 30-yd. dump cars.

THE BRIER HILL IRON & STEEL COMPANY, Youngstown, Ohio, noted in the *Railway Age* of January 18 as being in the market for freight cars, has ordered 40 70-ton steel hopper, and 10 70-ton steel gondola cars from the Pressed Steel Car Company and 25 general service cars from the Clark Car Company.

Signaling

THE PENNSYLVANIA has ordered from the General Railway Signal Company material for an eight-lever Saxby & Farmer interlocking machine at Cresson, Pa.

THE PENNSYLVANIA LINES WEST of Pittsburgh (the Louisville Bridge Company) will have mechanical interlocking on the new drawbridge at Louisville; a Saxby & Farmer machine with 30 working levers and 6 spare spaces. The contract for the material and for installation has been given to the General Railway Signal Company.

THE BALTIMORE & OHIO has ordered from the General Railway Signal Company two 56-lever electric interlocking machines. One for Rockwood, Pa., and the other for Confluence, Pa. The high, medium and low speed home signals will be Model 2A dynamic indication. The dwarf signals will be 110 volt d. c. with battery indication, and the switch machines Model 2 with dynamic indication. The installations will be made by the railroad company's forces.

Supply Trade News

P. M. Wagstaff has been appointed railroad representative for the Onondaga Steel Company, Inc., Syracuse, N. Y.

Charles S. Bilyeu, who recently became associated with the Gulick-Henderson Company, New York, has been appointed assistant to the president.

F. A. Driver, for many years a director of the Driver-Harris Wire Company and identified with the company since its inception, died January 21 at the age of 82 years.

R. P. Lamont, president of the American Steel Foundries, with office at Chicago, Ill., has been commissioned a lieutenant-colonel by the War Department and appointed assistant chief of the procurement division of the ordnance department and has reported to Washington for duty.

Ralph F. Tillman has been elected vice-president of the Wine Railway Appliance Company, Toledo, Ohio, in charge of western sales with headquarters in Chicago, effective February 1. **W. F. Cremean** has been appointed assistant to the president of the company in charge of eastern sales with headquarters in Wilkes-Barre, Pa., also effective February 1.

At the meeting of the board of directors of the Union Steel Casting Company, Pittsburgh, Pa., **C. C. Smith,** formerly president of the company, was elected chairman of the board of directors. **J. P. Allen,** formerly vice-president, was elected president. The remaining officers of the company were re-elected as follows: **S. H. Church,** vice-president; **G. W. Eisenbeis,** treasurer; **W. C. Eichenlaub,** secretary, and **J. B. Henry,** general superintendent.

Charles D. Jenks, who has been the active business executive of Edwin S. Woods & Co., Chicago, has severed his connection with that concern, effective January 31, having been elected president and a director of the Damascus Brake Beam Company, with headquarters in Cleveland, Ohio. He was formerly in the operating and sales department of the Pressed Steel Car Company at Pittsburgh, Pa., and Chicago, and western sales manager for the Standard Coupler Company, leaving the latter concern in 1912 to go with Edwin S. Woods & Co. In his new position as president of the Damascus Brake Beam Company he will assume the active management of the operation and sales department.

C. D. Jenks

Cameron C. Smith, chairman of the board of the Union Steel Casting Company, Pittsburgh, was on January 15 appointed Major Ordnance Reserve Corps, and has been assigned to the Production Department, Carriage Division of the Ordnance Department of the U. S. Army, with headquarters in Washington. Mr. Smith was born in Clinton Township, Butler County, Pa., April 2, 1861. His first position was as stenographer in the office of Wilson Walker & Co., iron and steel manufacturers of Pittsburgh, Pa. He was with them ten years, during which time it was merged into the Carnegie, Phipps & Co., and then into the Carnegie Steel Company. He left the employ of the Carnegie Steel Company in 1893, and accepted a position with the Reliance Steel Casting Co., of Pittsburgh, being with them six years, when in 1899 he withdrew to organize the Union Steel Casting Company, of Pittsburgh, Pa. He was secretary and general manager during the first year of the existence of the Union Steel Casting Company, and in 1900 was elected president, which position he has held until January 26, 1918, when he was elected chairman of the board of directors.

W. H. Lovekin has been appointed assistant to the president of the Locomotive Feed Water Heater Company, effective January 1, 1918. Mr. Lovekin has been with the company since June, 1916. He was born in Philadelphia, Pa., and received his education in the public schools of that place, Haverford Preparatory School and Princeton University. He started his business career in the banking house of the Logan Trust Company, of Philadelphia. Later he accepted a position on the staff of the Bureau of Municipal Research of Philadelphia. On leaving the Bureau of Municipal Research he entered the sales department of R. J. Crozier & Co., of Philadelphia, where because of special qualifications he was shortly assigned to the railroad field. This position as sales representative in the railroad field brought him into intimate contact with railroad men. On June 1, 1916, he entered the service of the Locomotive Feed Water Heater Company as special representative. In this capacity he was intimately connected with the development of feed water heaters for locomotives and ships. In April of this year he was made assistant to vice president from which position he is now promoted.

W. H. Lovekin

Waldo H. Marshall to Assist Colonel Tripp in Ordnance Department

Waldo H. Marshall, formerly president of the American Locomotive Company, and now associated with J. P. Morgan & Co., has been appointed assistant chief of the Division of Production of the Ordnance Department.

Colonel Guy E. Tripp, chief of that department, in announceing the appointment Tuesday, said:

"Mr. Marshall's wide experience in manufacturing and recognized ability to solve various production problems will be, it is felt, of great advantage to that division. His appointment marks another step forward in the recently adopted policy of appointing civilians to important posts in the War Department."

Mr. Marshall was on the staff of Edward R. Stettinius (now Surveyor General of Supplies in the War Department) in the munitions department of J. P. Morgan & Co. Born in 1864, Mr. Marshall began his business life as a railroad man. He became assistant superintendent of motive power for the Chicago & North Western in 1897; was appointed superintendent of motive power for the Lake Shore & Michigan Southern in 1899; was made general superintendent of that road in 1902, and general manager in 1903, his jurisdiction extending also over the Lake Erie & Western and the Indiana, Illinois, and Iowa. In 1906, he was elected president of the American Locomotive Company.

U. S. Foreign Trade Record of 1917.—In foreign commerce the year 1917, says a bulletin of the National City Bank of New York, far exceeds in value of merchandise imported or exported that of any earlier year. Total imports for the full calendar year 1917, according to the bank's statement, are 60 per cent greater in value than in 1913 and exports of domestic products 150 per cent. greater in value than those of 1913. The total foreign trade of the country is estimated in very round terms at 9 billion dollars in 1917 against 4¼ billion dollars in 1913, the total of imports and exports combined being thus more than double in 1917 that of 1913.

Financial and Construction

Railway Financial News

BALTIMORE & OHIO.—This company has placed a six months' loan of $8,000,000. Kuhn, Loeb & Co. and Speyer & Co. are the bankers in the transactions. The loan has been placed privately among banks and trust companies and there will be no public offering of securities.

DENVER & RIO GRANDE.—Judge Walter H. Sanborn, in the United District Court, at Denver, Colo., on January 26, named Alexander R. Baldwin, vice-president of the Western Pacific, and Edward L. Brown, president of the Denver & Rio Grande, receivers for the latter road.

PITTSBURGH, FORT WAYNE & CHICAGO.—This company has increased its capital stock from $72,150,000 to $100,000,000. This stock will be issued, it is understood, to reimburse the Pennsylvania Company for addition and betterment expenditures.

ST. LOUIS & MISSOURI SOUTHERN.—M. J. Conran, receiver, will offer this road for sale on February 6, at New Madrid, Mo.

Railway Construction

BLACK MOUNTAIN RAILROAD.—A contract has been given to J. H. Bailey, to build an eight-mile line from Hulan, Ky., on the Cumberland branch of the Louisville & Nashville up Pucketts creek. Work is now under way and will be pushed to completion. The maximum grade will be 2 per cent and the maximum curvature 10 per cent; there will be 6 bridges and the line will traverse coal lands. The plans also include double tracking the line at an early date. The company was incorporated in Kentucky with offices at Fredonia, N. Y., and Pineville, Ky. W. H. Frost, president; J. S. Lambert, vice-president, Fredonia; M. E. S. Posey, chief engineer, Pineville.

GREAT NORTHERN.—This company is building an extension to its dock at Seattle, Wash., at a cost of about $50,000. Grant Smith & Co., St. Paul, Minn., have the contract for the work.

GULF, COLORADO & SANTA FE.—This company will sink a well and make other improvements to its water facilities at Kirbyville, Tex., at an estimated cost of about $6,000.

MANATEE RIVER RAILWAY.—This company is building a line north from near Verna, Fla., on the East & West Coast near Bradentown; about 8 miles has been completed. It is expected that the line will eventually be extended to Wimauma on the Seaboard Air Line in Hillsborough county about 25 miles from Verna. A number of branch lines may also be built. W. D. Wilson, president, Citizens' Bank building, Tampa, Fla.

DANISH TRANSPORTATION DIFFICULTIES.—Denmark, like practically every other country in the world, whether belligerent or neutral, is suffering from a rolling-stock shortage due to the war. As far back as the autumn of 1915 merchandise awaiting transportation had accumulated to such an extent that it was impossible even to find sufficient warehouse accommodation, and this year the difficulty has become still further accentuated. The problem is serious, as may be seen from the fact that 12 months ago the State Railways Administration was unable to supply the port of Copenhagen with more than 25 per cent of the cars required, with the result that merchandise which could not be despatched accumulated daily. Hopes were entertained that there would be an improvement after the harvesting of the last best crop, but these expectations have not been realized, owing to the combined effects of intense and prolonged cold weather and the coal shortage. Passenger traffic was restricted at the beginning of the year, since when further and more drastic restrictions have had to be enforced. No noticeable improvement is expected until it is possible to add to the rolling stock.—*Railway Gazette, London.*

Railway Officers

Executive, Financial, Legal and Accounting

G. C. Hand, secretary of the Kansas City Southern, with headquarters at New York, has been elected vice-president, succeeding **J. Sorenson,** resigned to go into other business.

P. Richardson, assistant superintendent of the Detroit & Mackinac with office at Alpena, Mich., has been appointed auditor, assistant treasurer and purchasing agent, vice, **George M. Crocker,** deceased.

Stephen Birch, vice president of the Copper River & Northwestern and the Alaska Steamship Company, with headquarters at New York, has been elected president of both companies, succeeding **S. W. Eccles,** deceased.

B. I. Spock, general solicitor of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., has resigned, effective February 1; **J. C. Sweeney,** general attorney, with office at New Haven has been appointed general solicitor to succeed Mr. Spock; **N. W. Smith,** Rhode Island counsel, with office at Providence, has been appointed general attorney with office at New Haven succeeding Mr. Sweeney; **W. L. Barnett,** Connecticut counsel,, with office at New Haven, has been appointed Rhode Island counsel, with office at Providence. **N. F. Buckingham,** assistant counsel, with office at New Haven, has been appointed Connecticut counsel with office at New Haven, to succeed Mr. Barnett; and **A. P. Russell,** valuation counsel with office at New Haven, will continue in his present duties and will also act as federal counsel.

Operating

E. H. Campbell, general freight and passenger agent of the Kansas City Northwestern at Kansas City, Kan., was appointed superintendent succeeding **O. S. Lamb,** resigned, effective January 24, with the same headquarters.

F. L. Birdsall superintendent of the Minnesota, Dakota & Western, with headquarters at International Falls, Minn., has been appointed trainmaster of the Northern Pacific with headquarters at Minneapolis, Minn., succeeding **J. H. Johnson,** promoted.

J. B. Parrish superintendent of freight transportation of the Chesapeake & Ohio, with office at Cincinnati, Ohio, has been appointed general superintendent of the Western general division, with headquarters Huntington, W. Va., and **F. L. Poindexter,** assistant trainmaster with office at Boston, Ind., has been appointed superintendent of freight transportation, with headquarters Cincinnati.

Thomas M. McLaughlin, whose appointment as superintendent of the Eastern division of the Maine Central with headquarters at Bangor, Maine, has already been announced in these columns, was born in April 1869, at Grand Falls, N. B., and was educated at Mattanawessk Academy, Lincoln, Maine. He began railway work in October, 1885, as a freight brakeman on the Maine Central. He learned telegraphy, and about a year later he entered station service. For the last five years he has been assistant division superintendent with headquarters at Waterville, and on January 1 he was appointed superintendent of the same road as above noted. Mr. McLaughlin's entire railway service has been with the Maine Central.

Maurice Bailey, whose appointment as general superintendent of the Missouri, Oklahoma & Gulf with headquarters at Muskogee, Okla., was announced in these columns on December 28, was born at Galesburg, Ill. He entered the service of the Chicago, Burlington & Quincy in 1882 as a machinist apprentice and in 1887 was promoted to locomotive engineer. In 1888 he entered the service of the Chicago Great Western, with which road he remained for 23 years, serving consecutively as locomotive engineer, roundhouse foreman, master mechanic, trainmaster and superintendent. He resigned in 1911 to become general manager of the Mus-

catine, Burlington & Southern with office at Muscatine, Iowa, and was later made president and general manager, which position he resigned to take the position noted above.

E. L. Bock, superintendent of the Huntington division of the Chesapeake & Ohio, with office at Huntington, W. Va., has been appointed assistant general superintendent of the Western general division and the C. & O. Northern, with headquarters at Huntington; **F. L. Fletcher,** superintendent of terminals at Louisville, Ky., has been appointed superintendent of the Huntington division, with office at Huntington, W. Va., vice Mr. Bock; **H. T. Brown,** trainmaster at Huntington, has been appointed assistant superintendent of the Cincinnati division and the C. & O. Northern, with headquarters at Russell, Ky. **C. A. Pennington,** assistant superintendent, with office at Huntington, W. Va., has been appointed superintendent of the Louisville & Jeffersonville Bridge & Railroad Company, with office at Louisville, Ky., vice **F. L. Fletcher,** and the office of assistant superintendent of the Huntington division has been discontinued.

J. A. Shepherd, whose appointment as superintendent of the Green river division of the Denver & Rio Grande with headquarters at Helper, Utah, was announced in these columns on January 18, was born at Homer, Ill., on April 21, 1874. He entered railway service in August, 1893, with the Wabash, serving as operator, despatcher and chief despatcher until December, 1901. From January, 1902, until March, 1904, he was superintendent on the Western Maryland at Hagerstown, Md.; and from March, 1904, to January, 1905, assistant superintendent of the Terminal Railroad Association at St. Louis, Mo. On the latter date he was appointed superintendent on the Western Maryland at Baltimore, Md., and in April, 1911, he was promoted to general manager, in which capacity he remained until January, 1913, when he became superintendent of terminals on the Missouri Pacific at Kansas City, Mo. In November, 1916, he went to New Orleans, La., to become general manager of the Trans-Mississippi Terminal. In November, 1917, he entered the service of the Denver & Rio Grande as assistant superintendent at Helper, Utah, which position he held until January 1, when his appointment as noted above became effective.

Austin Edward Wallace, Jr., who has been appointed general superintendent of the Chicago and Marion divisions of the Erie, with headquarters at Chicago, as has already been announced in these columns, was born March 3, 1879, at Nashua, N. H., and was educated at Harvard University. He began railway work in November, 1902, and served consecutively as clerk and timekeeper on the Great Northern at Larimore, N. D., until January, 1904, when he became yard clerk on the Chicago, Rock Island & Pacific, and subsequently served first as timekeeper and then as chief clerk to superintendent at Cedar Rapids, Iowa, on the same road. In January, 1907, he went to the Chicago, Burlington & Quincy as special inspector at Alliance, Neb., and from September, 1909, to February, 1911, he served successively as assistant extra gang foreman, foreman, assistant roadmaster, assistant trainmaster and trainmaster. From February to September, 1911, he was special inspector, with headquarters at Chicago. He then served on the staff of the second vice-president at Chicago, and later as assistant superintendent, with office at St. Paul, Minn., on the same road. In July, 1912, he returned to the service of the Chicago, Rock Island & Pacific as superintendent, with office at Cedar Rapids, Iowa, and in February, 1913, he was transferred in the same capacity to Manly, Iowa, which position he held until his recent appointment as general superintendent of the Chicago and Marion divisions of the Erie as above noted.

Traffic

J. J. Lane, local freight agent of the Delaware, Lackawanna & Western at Newark, N. J., has been appointed division freight agent, with headquarters at Newark.

R. L. Gohmert has been appointed assistant general freight agent of the San Antonio, Uvalde & Gulf with office at San Antonio, Texas, vice **J. L. McDonald,** resigned.

Edward T. Campbell, general traffic manager of the Erie, with office at Chicago, has been assigned to special duty, reporting to the president, with headquarters at New York.

J. F. Gavin was appointed general freight and passenger agent of the Kansas City Northwestern with headquarters at Kansas City, Kan., succeeding **E. H. Campbell,** promoted, effective January 24.

W. H. Ward, chief of Tariff Bureau of the Indiana Harbor Belt at Chicago has been promoted to general freight agent, succeeding J. W. Bingham, resigned to become traffic manager of the Corn Products Refining Company, Chicago, with headquarters at Chicago.

Engineering and Rolling Stock

C. U. Irvine has been appointed division engineer of the Southern Railway in Mississippi, with headquarters at Columbus, Miss., vice, **W. F. McDade,** resigned.

L. B. Allen, general superintendent of the Chesapeake & Ohio, at Huntington, W. Va., has been appointed superintendent maintenance of way, with office at Huntington.

H. Stringfellow, assistant engineer of the Southern Railway, with office at Eutaw, Ala., has been promoted to district engineer; with headquarters at Lexington, Ky., succeeding **H. P. Mehler,** assigned to other duties.

William Snell, district general car foreman of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been transferred to the newly created position of the same rank at the Chicago terminal, effective February 1.

W. E. Burkhalter has been appointed acting division engineer of the St. Louis division of the Mobile & Ohio, with headquarters at Murphysboro, Ill., Vice, **J. L. Cummings** who has been appointed acting bridge engineer with office at Mobile, Ala., vice **H. Austill** furloughed to enter military service and **S. F. Ryan** has been appointed acting assistant engineer with office at Mobile, vice **L. P. O. Exley** assigned to other duties.

L. K. Sillcox, mechanical engineer of the Illinois Central in charge of car work, has been appointed master car builder of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., effective February 1. He was born at Germantown, Pa., on April 30, 1886, and was educated at Trinity School, New York, and the Mechanical & Electrical Institute of Brussels. He entered railway service in 1903 as an apprentice in the High Bridge shops of the New York Central, leaving there in 1906 to go with the McSherry Manufacturing Company at Middletown, Ohio. He resigned from that company as assistant shop superintendent in 1909 to become shop engineer of the Canadian Car & Foundry Company at Montreal. He left his position with the latter company in 1912 to become mechanical engineer of the Canadian Northern. In 1916 he was appointed to a similar position with the Illinois Central in charge of car work, from which he resigned to accept the appointment as noted above.

Railway Officers in Military Service

W. H. Wharton, commercial agent of the Nashville, Chattanooga & St. Louis at Chicago, has been commissioned first lieutenant in the ordnance department of the United States army for transportation work.

Obituary

W. A. Newell, commercial agent of the St. Louis Southwestern at Chicago, Ill., died in that city on January 23.

Carlton Hillyer, formerly from 1870 to 1914, auditor of the Georgia Railroad, died at Augusta, Ga., on January 17, at the age of 74.

C. A. McLeod, vice-dean of the faculty of applied science of McGill University at Montreal, Que., died in that city on December 26. He was professor of geodesy and surveying and had charge of McGill Observatory. He was born at Strathlorn, Cape Breton, N. B., in 1851, and his first engineering work was done while in charge of section construction on the Intercolonial, following which he was resident engineer on construction of the Prince Edward Island. He was charter member of the Canadian Society of Civil Engineers and served as secretary for twenty-five years, holding that position at the time of his death.